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TRADE AND DEVELOPMENT BOARD
Committee on Shipping
Ad hoc Intergovernmental Group of Port Experts
Geneva, 24 September 1990
Item 2 of the provisional agenda

ADOPTION OF THE AGENDA AND ORGANIZATION OF WORK

Provisional agenda, annotations to the provisional agenda and suggestions for the organization of the work of the Ad hoc Intergovernmental Group of Port Experts

Note by the UNCTAD secretariat

I. PROVISIONAL AGENDA

1. Election of officers
2. Adoption of the agenda and organization of work
3. Port development, operations and administration
4. Port management training and technical co-operation
5. Work programme
6. Other business
7. Adoption of the report of the Ad hoc Intergovernmental Group to the Committee on Shipping

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II. ANNOTATIONS TO THE PROVISIONAL AGENDA

Introduction

In paragraphs 16 and 17 of its resolution 61 (XIII) section IV, adopted on 22 March 1988, the Committee on Shipping, inter alia,

"Invites the Secretary-General of UNCTAD to convene, within available resources, not later than the third quarter of 1989, an ad hoc intergovernmental group of port experts to review the practical problems which arise in respect of the development, improvement and operation of ports, and in the light of this review:

(a) To examine the secretariat's work in relation to the three highest priority studies requested at the first session of the Group, namely:

(i) Problems arising in setting up trans-shipment facilities in developing countries (taking account of the interest of both ports and ship operators);

(ii) Data processing in the domain of port operation and documentation;

(iii) Maintenance of port equipment;

and study

(iv) The possibilities for regional co-operation in developing countries in the field of ports, with a view to ensuring the best use of scarce resources,

and to propose follow-up action appropriate for local, national and intergovernmental consideration.

(b) To review and monitor the work carried out by UNCTAD in the field of port management training and advisory services and to make suggestions for future activities.

(c) To prepare a report, with recommendations for the future work of the secretariat, for submission to the Committee on Shipping at its fourteenth session.

Recommends that States members of UNCTAD participate in the ad hoc intergovernmental group of experts on ports by sending persons with special responsibility for, or expertise in, port policy or the management and operation of ports."

In order to allow time for adequate preparations the meeting of the Ad hoc Group has been postponed until September 1990 and thus the Group will submit its report to the Committee on Shipping at its fifteenth session.

Item 1: Election of officers

It is suggested that the Ad hoc Group may wish to elect a Chairman, a Vice-Chairman and a Rapporteur.

Item 2: Adoption of the agenda and organization of work

The provisional agenda for this, the second intergovernmental meeting convened by UNCTAD to discuss ports, has been drawn up by the UNCTAD secretariat. After the adoption of the agenda, the Ad hoc Group may wish to decide on the organization of its work.

The Group will have five working days to complete its business. It is suggested that morning meetings be held from 10.00 a.m. to 1.00 p.m. and afternoon meetings from 3.00 p.m. to 6.00 p.m. The secretariat believes that the objectives of the meeting would be well served by an exchange of views among all the experts meeting together and by a joint effort to draft recommendations on the items under consideration. In addition, arrangements can be made, on request, for experts from countries belonging to regional groupings to meet in private. It would be useful if the Group's substantive deliberations in plenary could be completed by the morning of Thursday, 27 September in order to allow ample time for preparation of the draft report which should be adopted on Friday, 28 September.

Item 3: Port development, operations and administration

Document:

"Port development: the role of UNCTAD" - report by the UNCTAD secretariat (TD/B/C.4/AC.7/7 (Part I))

Background documents:

"The establishment of trans-shipment facilities in developing countries" - report by the UNCTAD secretariat (TD/B/C.4/AC.7/10)

"Guidelines for port managers on the use of computers" - report by the UNCTAD secretariat (TD/B/C.4/AC.7/11)

"Maintenance of port equipment" - report by the UNCTAD secretariat (TD/B/C.4/AC.7/9)

"Co-operation among ports in developing countries" report by the UNCTAD secretariat (TD/B/C.4/AC.7/8)

"Port administration: A noteworthy experience in Morocco" (UNCTAD/SHIP/627)

Document TD/B/C.4/AC.7/7 (Part I) outlines the work carried out by the secretariat in the field of port development, operations and administration since the meeting of the first Ad hoc Intergovernmental Group of Port Experts and summarizes the studies requested by the Ad hoc Group and the Committee on Shipping. The background documents are described below.

TD/B/C.4/AC.7/10 is the first priority study requested by the Group. It compliments a preliminary note on the subject (TD/B/C.4/293) and examines the issues faced by developing countries in establishing transshipment facilities taking into account the ports, shipping and shippers' interests.

TD/B/C.4/AC.7/11, the second priority study requested by the Group, provides guidelines to port managers for the introduction and development of computerized information systems. An example of an information system developed for a container terminal is described.

TD/B/C.4/AC.7/9, the third priority study requested by the Group, presents the results of the analytical work and training activities carried out by the secretariat, in co-operation with the World Bank, in the field of port equipment management and maintenance and contains recommendations for Governments and port authorities.

In resolution 61 (XIII), the secretariat was requested to study the possibility for regional co-operation in developing countries in the field of ports. TD/B/C.4/AC.7/8 has been submitted in response to this request.

The Group also recommended that additional themes be studied whenever sufficient resources are available. UNCTAD/SHIP/627 presents the experience Morocco has had in the reorganization of the port sector. The preparation of this document has been financed from extra-budgetary resources.

Item 4: Port management training and technical co-operation

Documents:

"Port development: the role of UNCTAD" (TD/B/C.4/AC.7/7 (Part II))

TD/B/C.4/AC.7/7 (Part II) reviews the work carried out by the secretariat in the field of port management training and in technical assistance.

Item 5: Work programme

Documents:

"Port development: the role of UNCTAD" (TD/B/C.4/AC.7/7 (Part III))

TD/B/C.4/AC.7/7 (Part III) suggests a future work programme for the secretariat.

Item 6: Other business

Item 7: Adoption of the report of the Ad hoc Intergovernmental Group to the Committee on Shipping

The report of the Group will be submitted to the Committee on Shipping at its fifteenth session.

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9 August 1990

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TRADE AND DEVELOPMENT BOARD
Committee on Shipping
Ad hoc Intergovernmental Group of Port Experts
Geneva, 24 September 1990
Items 3, 4 and 5 of the provisional agenda

PORT DEVELOPMENT

THE ROLE OF UNCTAD

Report by the UNCTAD secretariat

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INTRODUCTION

(i) The Ad hoc Intergovernmental Group of Port Experts held its first session in Geneva from 25 February to 5 March 1986. It adopted a series of general recommendations, as well as recommendations relating specifically to UNCTAD's future programme of work concerning ports. Those recommendations are contained in annex 1 to the document entitled "Report of the Ad hoc Intergovernmental Group of Port Experts" (TD/B/C.4/298-TD/B/C.4/AC.7/5).

(ii) The UNCTAD Committee on Shipping considered the recommendations at its thirteenth session (14-22 May 1988). In its resolution 61 (XIII) it, inter alia, invited:

> "... the Secretary-General of UNCTAD to convene, within available resources, not later than the third quarter of 1989, an ad hoc intergovernmental group of port experts to review the practical problems which arise in respect of the development, improvement and operation of ports, and in the light of this review:
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>
> (c) To prepare a report, with recommendations for the future work of the secretariat, for submission to the Committee on Shipping at its fourteenth session."

(iii) To allow sufficient time for adequate preparation, it was not possible to hold the meeting of the Ad hoc Intergovernmental Group of Port Experts in 1989. The dates finally set for that meeting are 24 to 28 September 1990.

(iv) In order to facilitate the Group's deliberations, the agenda has been organized around the following three main technical topics:

Port administration, operation and development;

Port management training and technical co-operation; and

Programme of work.

(v) The present document has been prepared as a basis for the Group's discussions on these topics. It consists of three sections, each devoted to one of the topics. The full agenda for the meeting is as follows:

1. Election of officers.

2. Adoption of agenda and organization of work.

3. Port administration, operation and development.

4. Training and technical co-operation.

5. Programme of work.

6. Other matters.

7. Adoption of the Intergovernmental Group's report to the Committee on Shipping.

SURVEY OF THE QUALITY AND USEFULNESS OF UNCTAD PUBLICATIONS AND OF THEIR END-USERS

The UNCTAD secretariat, in the context of its programme evaluation activities and in response to intergovernmental requests, is seeking the opinions of end-users in order to have basic data for assessing the quality, usefulness and effectiveness of *inter alia* its research reports and publications. As the success of such an exercise is critically dependent on an adequate rate of response we should appreciate it if you would take time to answer the questions below and submit any other comments that you may have concerning the current document.

1. **Title or symbol number of document** . . . . . .

2. **When did you receive the document?** . . . . . .

3. **How did you receive the document?** *(tick one or more boxes)*

Through Permanent Mission to United Nations	( )	From UN bookshop	( )
From ministry or government office	( )	From university libraries	( )
Directly from UNCTAD secretariat	( )	Own request	( )
By participating in an UN/UNCTAD intergovernmental meeting	( )	UNCTAD initiative	( )
		Other (please specify)	. . . . .
By participating in an UN/UNCTAD sponsored training course or seminar	( )	. . . . .	
		. . . . .	

4. **For what main purposes do you use the document?** *(tick one or more boxes)*

Policy formulation	( )	Education and training	( )
Analysis and research	( )	Management	( )
Legislation	( )	Other (please specify)	. . . . .
Background information	( )	. . . . .	

5. **How do you rate the document as regards:**

Its usefulness to your work *(tick one box)*

Extremely useful ( ); Very useful ( ); Useful ( ); Marginally useful ( ); Not at all ( ).

Its quality, in terms of the following aspects *(tick one box in each case)*:

	Outstanding	*Excellent*	*Good*	*Adequate*	*Poor*
Presentation and readability	( )	( )	( )	( )	( )
Originality of ideas	( )	( )	( )	( )	( )
Wealth of information	( )	( )	( )	( )	( )
Up-to-date information	( )	( )	( )	( )	( )
Technical accuracy	( )	( )	( )	( )	( )
Quality of analysis, including objectivity	( )	( )	( )	( )	( )
Validity of conclusions	( )	( )	( )	( )	( )
Clarity of recommendations	( )	( )	( )	( )	( )
Comprehensiveness of coverage	( )	( )	( )	( )	( )

6. **Other observations** *(if any)* . . . . . .

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Finally, we would appreciate it if you could provide the following information about yourself:

Name . . . . . .Occupation/Functional title . . . . . .

Address . . . . . .

Your answers are for internal use and will be kept confidential. Thank you for your co-operation.

Please forward the questionnaire to : PROGRAMME CO-ORDINATION AND EVALUATION UNIT
EXECUTIVE DIRECTION AND MANAGEMENT
UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT
PALAIS DES NATIONS – CH-1211 GENEVA 10

I. PORT ADMINISTRATION, OPERATION AND DEVELOPMENT

(agenda item 3)

1. In this area, the secretariat has prepared five studies on topical themes agreed on at the Group's first session for inclusion in the secretariat's research programme. They are:

"The establishment of transhipment facilities in developing countries" (TD/B/C.4/AC.7/10);

"Guidelines for port managers on the use of computers" (TD/B/C.4/AC.7/11);

"Maintenance of port equipment" (TD/B/C.4/AC.7/9);

"Co-operation among ports in developing countries" (TD/B/C.4/AC.7/8);

"Port organization and administration: a noteworthy experiment in Morocco" (UNCTAD/SHIP/627).

2. The first four studies were specifically requested by the Committee on Shipping (resolution 62 (XIII)). The fifth, which was financed from extrabudgetary resources, deals with the topic "organization and administration of ports", agreed on at the Group's first session as one of the themes to be studied when sufficient resources became available.

3. The five studies have been issued as resource documents for the meeting, as the present report is the only official document on agenda items 3, 4 and 5. An oral presentation of the studies will be given by the secretariat. A summary of their content is, however, necessary in order to facilitate the Group's work.

The establishment of transhipment facilities in developing countries (TD/B/C.4/AC.7/10)

4. This study concerns one of the research areas accorded priority at the first session of the Ad hoc Intergovernmental Group of Port Experts. The contents of an initial report produced by the secretariat, entitled "Transhipment ports" (TD/B/C.4/293), have been incorporated into this study. Given the importance of the topic, it was felt necessary to reproduce the conclusions and main recommendations of the study.

5. This study has been focused on the container trade, a branch of shipping and port activity in which great changes have been or are being made. The big transoceanic shipping lines have taken advantage of the flexibility and scope for modulation afforded by the container technique to reorganize and restructure shipping services to regions of heavy traffic: Asia, the Middle East, Europe and North America. The traditional port-to-port routes have been replaced by veritable gridded networks assembled around transhipment ports: the points at which different trades intersect and interconnect. The lines have thus been able to combine trades and, by increasing the size of their ships and making full use of them, have achieved economies of scale in deep-sea hauls and reduced unit costs and transit times. By organizing - often alone, or with other shipping lines - secondary transport networks served by purpose-designed feeder ships, they have increased the number of ports served from a single port of shipment.

By extending their operations upstream and downstream, they have achieved sweeping economies of scope and gained other advantages that enabled them to offer shippers a made-to-measure service.

6. In the regions concerned, these changes have altered the traditional traits of the regular-route sector. The services rendered have been made more competitive; this has affected freight rates and the trade development of the countries concerned to the point where some of them have seen fit to review their national shipping policy, placing greater emphasis on promoting the interests of users of shipping services.

7. This study has led to a number of findings and sometimes to recommendations addressed to the main active parties in developing countries who are faced with the challenges, and often the difficulties, attendant on these changes, in order to help them to tackle them more effectively. The situation prevailing in regions such as Asia, however, is so different from that in other areas where the transport chain based on containerization is merely beginning the process of integration (Africa and Latin America in particular) that any generalization would be haphazard and sometimes even dangerous. In Asia, for example, two important transhipment ports, Hong Kong and Singapore, have already passed the 4 million TEU mark in total traffic per annum; this is of the same order of magnitude as the container trade recorded by all the developing countries in Africa and South America combined. There are no indications of any reduction in the disparity between these two situations.

8. Although transhipment activities are very often carried on by independent operators - transoceanic and feeder shipping lines, port authorities and shippers - government authorities are necessarily involved, for they can either facilitate the development of such operations or, on the contrary, slow them down or prevent them altogether. If they leave the shippers to choose the best services the ship has to offer, and contribute to the financing of all or some of the requisite heavy infrastructures, those authorities facilitate the development of the gridded networks. This is an area that calls for a pragmatic and realistic approach. The trade-off between the interests of trade, of the shippers, of the national flag and of the port authorities is a difficult operation; every case is unique and must be dealt with accordingly. To this end it is an increasingly clear necessity that the ruling in each case should be made by the political authority on the basis of comprehensive and accurate technical and economic data. It is accordingly worthwhile to draw attention again to the recommendations made previously by the UNCTAD secretariat for the establishment or strengthening of shipping and port investigation units, responsible for preparing the file for such rulings and strategic choices and facilitating political decisions by making it possible to compare the expected advantages and costs of each of the options open.

9. In the specific area of ports and the choice of a national strategy by the government authorities for the development of port facilities, the emergence of these new transport techniques once again confronts the authorities with the necessity of taking highly important investment decisions while trying to foresee the subsequent behaviour of the shipping lines, which call the tune so far as transhipment activities are concerned. Countries which wish to invest in order to attract this highly volatile traffic, and whose own traffic is of limited volume, cannot be too strongly recommended

to exercise caution, and the further they are from the main transoceanic trades the greater the caution required, for the distance necessarily affects the economic prospects of the operation and reduces the potential for its development.

10. It is a different matter for countries situated on or close to the main sea routes. They are, or will be, affected by this phenomenon and should make active preparations for it. The long-prevalent policy of favouring the development of several hub ports, sometimes only a few tens of kilometres apart, must often be revised in favour of concentrating at a very few sites the heavy investments which third-generation and sometimes fourth-generation container ships require. The scale of such investments should be chosen in the light of the most objective possible estimates of the prospects for traffic development. Furthermore it seems desirable to involve the big ocean-going shipping lines in those investments - as some ports, for example in Spain, have been wise enough to do - especially where the national traffic alone does not justify the expense. In addition, very high efficiency, stability and a good social climate must be guaranteed; otherwise - as there are many examples to prove - transhipment traffic will slip away to other ports.

11. The existence of these hub ports, veritable centres for consolidating and splitting up cargoes, goes hand in hand with the establishment - sometimes in the same country, often in neighbouring countries and occasionally in fairly distant countries - of a string of feeder ports, which are sometimes very rudimentary. These ports, situated close to centres of production and consumption, are vehicles for the development of trade and for regional promotion through the opening up of inaccessible territory. It would be desirable to give them greater consideration. For some countries not yet equipped with heavy port facilities, such ports open up worthwhile new prospects with a good ratio of service quality to investment costs.

12. At the regional level, since the study is limited in scope, it has not been possible to identify any agreements between countries concerning joint selection, financing and management of regional hub transhipment ports on the lines of the agreements which exist in other fields, such as that of regional training institutions. This means that any country wishing to acquire its own container reception facilities will be alone in bearing the cost (in tens of millions of dollars) and the risk.

13. The last part of the study describes the prerequisites for the successful installation of trans-shipment facilities.

14. The transhipment phenomenon and the associated operations of feeder lines and services already convey an idea of what transport and distribution networks will look like at the beginning of the next millennium. The main active parties are highly efficient and are putting up an impressive performance. This evolution in traditional sea transport is comparable in many ways with that observed in a great many service sectors. Without underestimating the difficulties of adaptation involved, it can be said that the process opens up new prospects and enables the most enterprising to face new challenges with the very weapons used by the pioneers in this field - drive, innovation, efficiency and often speed - in order not to be left behind. The sea transport sector has had the great merit of demonstrating that the developing countries can play an important part in this change;

some of the largest shipping lines and biggest transhipment ports are based in developing countries of East and South-East Asia. This, however, cannot conceal the fact that the vast majority of developing countries still have difficulty in fully and effectively adapting to containerization, and find themselves in a situation of having to bear the cost of containerization, particularly in terms of investment, without fully realizing its benefits. It would therefore be desirable to continue studying these questions in order to enable the maritime community to find solutions that would afford those countries equal access to the benefits of innovation and progress.

15. For the developing countries, transhipment is not a magic wand that will sweep away the many obstacles to the development of their sea-borne trade. It does, however, hold out new opportunities for a number of countries which are geographically remote or which stand to be swept aside by the present and future development of maritime trade and transport. These opportunities are not free from cost or risk for those that wish to house a transhipment node. In other cases, it may involve a reconsideration of shipping policies, in particular of the regulatory and promotional measures to be adopted to allow shipping to play an active role as catalyst of the countries national trade. It will be for the developing countries themselves to determine where their interest lies and whether or not to join in the transhipment race. Every country that wishes to take that course should include in its strategy the following measures:

- Not to over-invest, and to that end to prepare careful forecasts of traffic development and feasibility studies of port investments;

- To select the sites and not scatter the investment effort;

- To heed the competition from neighbouring ports and strive to offer something extra;

- To try to involve the big shipping lines in port investments;

- For those wishing to establish sizeable transhipment ports, to bear in mind that over-regulation (on cabotage, Customs, etc.) is apt to divert traffic to foreign ports;

- In establishing or in promoting the expansion of a national shipping line, to take the necessary measures to ensure the competitiveness of the fleet and thus to ensure the production of an exportable service;

- Not to reject the idea of national "feeder" ports as vehicles for the development of trade and for regional promotion through the opening up of inaccessible territory;

- Not to reject out of hand the idea of specializing in regional sea transport;

- To keep in mind that - as some Asian countries have shown - the sea transport and ports of developing countries may, given efficient management and competitiveness, be industries producing exportable services.

Guidelines for port managers on the use of computers (TD/B/C.4/AC.7/11)

16. The aim of this study is to advise port managers in developing countries regarding the best possible use of computers. Technological innovation is changing the conditions of information processing, storage and distribution. A recent study on the use of computers has shown that, while there are between 35,000 and 40,000 IBM mainframe computers in use throughout the world, the number of compatible personal computers is more than 10 million. It is in the interest of port managers to be fully informed of how this technology can assist them in managing and developing their ports more effectively.

17. The rapid development of computers and telecommunications and, in particular, the merging of these two technologies, have resulted in the development of computerized systems providing managers with fuller, more rapid and more accurate information than could be provided by earlier manual systems.

18. Many ports, even in developing countries, use computers. In many cases, these new tools are used for accounting, billing and pay-roll operations. However, there are many other spheres in which the computer can be used, including:

Monitoring of containers in terminals;

Monitoring of goods in port;

Stock control (spare parts, stores);

Staff monitoring;

Analytical accounting and cost control;

Documents in preparation for ships' calls;

Hydrographical studies, etc.

19. The study describes the main characteristics of these applications, inputs, outputs and the corresponding costs and benefits. It also describes much more fully the computerized system used in the Baltic container terminal at the port of Gdynia (Poland) (traffic volume 170,000 TEU).

20. One of the study's conclusions is that port managers at all levels who do not yet make use of computers as a management tool should be advised to do so. In addition, ports which already use computers should consider the possibility of introducing new systems and improving old ones. In doing so, it should be borne in mind that the important factor to be taken into account is not the size of the port, but the nature of the system. Very simple systems can be used in large ports and vice versa. It is also advisable to consider the possibility of using micro-computers, given their advantages, such as very low equipment and software costs, ease of use, reliability, standardization of computers and software. In conclusion, it will be noted that the development of computerized systems affords a good opportunity to improve organization and existing information systems, which in itself often results in considerable savings of time, effort and money.

21. Given the importance of this subject and of the mistakes made, often as a result of inexperience, in defining the nature and extent of systems, organizing them and deciding on the equipment needed, a second phase of the study is in preparation. It will provide fuller information on the steps to be followed in setting up a data-processing centre and computerized systems. More detailed information will be provided in particular on the stages in the analysis and design of the following systems:

Port statistics;

Spares management;

Container monitoring;

Cargo handling;

Staff monitoring;

Monitoring of vessels in port.

Other systems may be added.

22. It is planned to follow up this study with technical assistance and training activities to provide ports so wishing with help in implementing the systems described (or some of them).

23. Perhaps developing countries which wish to benefit from UNCTAD's experience to upgrade their port computer systems could so inform the Group. Developed countries with experience in this area, or which could either contribute to the financing of all or part of the technical assistance and training programmes or participate in their implementation, might also so inform the Group.

Maintenance of port equipment (TD/B/C.4/AC.7/9)

24. This field is of crucial importance for the proper operation of ports. Over the past year, it has been the subject of co-operation between the World Bank and UNCTAD, with the support of the Department of Trade and Industry of the United Kingdom. The World Bank has prepared a paper entitled "The management of port maintenance", and UNCTAD has developed teaching materials for a seminar financed by Sweden and entitled "IPP-3, Port equipment: general policy, management, maintenance". The seminar had its debut in Jamaica in December and further sessions are being planned. There are also a number of TRAINMAR courses for middle-management dealing with this question.

25. The World Bank and UNCTAD have also produced a video tape entitled "Operating and maintenance features of container handling systems". It should be remembered that a monograph on this topic entitled "Steps to effective maintenance" has already been published by UNCTAD and IAPH and that another entitled "Economic approach to equipment selection and replacement" is in preparation.

26. The report reviews the main lessons learned in the course of this work. It begins by examining the nature, causes and extent of the main problems involved in the use and maintenance of port equipment. UNCTAD and the World Bank have noted that such problems often derive from the fact that management - either port management or the overseeing authority - is not sufficiently well-informed on some matters such as the cost of proper maintenance and the need for proper organization of maintenance and purchasing services, not to mention the particularly costly consequences of poor maintenance. Consequently, the budgeting for and advance allocation of the funds essential to ensure proper maintenance are not always practised.

27. The following recommendations are intended as guidelines for meeting the requirements of proper equipment management and maintenance:

(a) Set realistic objectives, particularly with regard to the availability of equipment;

(b) Plan carefully what equipment is needed;

(c) Have a proper policy for replacement of equipment, which is often kept in service too long. The "life cycle costing" method is particularly advantageous for major items. The updated cost/benefit comparison method is the most exacting. The question of writing off equipment is often difficult to deal with, since practices and procedures are too cumbersome. "Cannibalizing" equipment is often a bad practice, but one which can be tolerated when the decision is taken by a senior official in special circumstances;

(d) Have a sound policy for purchasing and standardization of equipment and spare parts. When the volume of equipment so justifies, the supplier can be asked to ensure that sufficient stock is maintained by his local agent. However, in most cases, it is desirable for the supplier to provide a list of spare parts necessary for a sufficiently long period, with shipments every six months and a special account containing sufficient funds to cover the urgent shipment of parts. It is also advisable to standardize equipment and limit the number of suppliers contacted to avoid having too many brands which makes maintenance very difficult.

(e) Strengthen and modernize maintenance management and, in particular, give a high ranking to the maintenance functions in port hierarchy, decentralize some functions, sub-contract maintenance outside when it is more advantageous, cheaper and quicker to do so;

(f) Train managers and operatives;

(g) Provide for realistic implementation procedures.

28. The report concludes with the following recommendations which the Group may wish to consider:

Bearing in mind the above general reservations,

A. It is recommended that senior port managers and officials from government controlling agencies should be more informed, sensitized and trained on the importance of the port equipment maintenance function and in the application of a range of modern equipment management techniques to ports.

B. It is recommended that port equipment aid programmes should be framed as a package which, in the initial loan provisions, includes:

(a) Either funding for all the spares to be replaced in accordance with the manual for periods of some years (e.g. four years) to be dispatched at six-monthly intervals, plus maintaining an escrow account in the name of the port and the manufacturer for an agreed sum; or a commitment by the manufacturer that all the necessary spare parts will be available in the store of the local agent, over the life of the equipment;

(b) Training by the equipment manufacturers of the initial establishment of technicians needed to maintain the equipment, and follow-up training of replacement technicians to be organized by the recipient port over the equipment's life.

29. The Ad Hoc Group may wish to consider the desirability of donor and recipient Governments participating in a Group session to agree guidelines for port equipment aid programmes.

C. It is recommended that manufacturers of port equipment should adopt special maintenance technique standards in equipment supplied to developing countries. These standards should include ease of repair under difficult conditions, greater replaceability and interchangeability of sub-assemblies, enhanced documentation, and more detailed spare scales for tropical and humid climates.

30. The Ad Hoc Group may wish to consider the desirability of representatives of manufacturing countries and of ports in developing countries participating in a Group session to agree guidelines for manufacturers.

D. It is recommended that government agencies which are responsible for supervising ports in developing countries should exert greater control over bilateral aid projects involving the supply of port equipment. This control should be aimed at, inter alia, reducing the number of different makes of any class of equipment to the minimum.

31. The Ad Hoc Group may wish to consider ways of implementing short policy seminars, for appropriate high-level officials, on such maintenance-related issues.

32. The Ad Hoc Group may wish to consider ways of funding the widespread delivery of UNCTAD's Policy Seminar IPP3 on Equipment Management (developed within the "Improving Port Performance" programme).

E. It is recommended that ports make greater use of the possibilities for co-operation with other ports in their region in the solution of their maintenance problems (spares procurement, training, specialist trouble-shooting, etc.). They should also pursue more vigorously the co-operation with ports in developed countries that the Ad Hoc Group has previously endorsed, and include in this a specific maintenance support element, in which the local donor agency should be included. The Ad Hoc Group may wish to consider ways of strengthening the South-South and North-South co-operation.

F. It is recommended that in view of the need to develop a sound training policy, and to strengthen in-house training, ports in developing countries should join the TRAINMAR network, participate in the training of trainers, and make full use of national and international training programmes developed by all co-operating agencies.

Co-operation among ports in developing countries (TD/B/C.4/AC.7/8)

33. This subject has given rise to much discussion and many recommendations, particularly at various meetings organized by UNCTAD over the past 10 years. With a view to encouraging such co-operation, the UNCTAD secretariat carried out a survey of ports and port associations. The results are analysed in this report. In particular, the main impediments to such co-operation are studied, as are the fields where it has developed most successfully. Among the main reasons which seem to have impeded the development of co-operation between ports, lack of money comes first. But a closer analysis shows that port authorities have the resources they need in order to be able to meet and co-operate. The fact that the necessary financial resources are not allocated to this type of operation is rather an indication that the authorities do not perceive clearly enough the benefits they could reap, which would encourage them to set aside adequate funds. Other reasons cited to explain the lack of co-operation are: lack of political will, lack of suitable structures and, which seems more to the point, competition between ports. Among the areas in which co-operation among ports might be developed, the first place goes in this survey to training, an area where co-operation agreements have yielded results. Other areas mentioned are port tariffs and port statistics and information, pooling of port services or equipment, transfer of technical expertise, etc.

34. In the last chapter of the report, it is suggested that the aim should be, rather than to agree on general recommendations as in the past, to take on the contrary a pragmatic approach and concentrate on certain priority areas where it would be possible to build on past achievements in order to promote genuine progress in co-operation among ports. Those priority areas would be:

(a) Participation in the work of regional and international port associations, which give rise to statements and technical discussions of a very high level;

(b) Training and development of human resources, where the progress already made could be taken still further;

(c) Exchange of technical expertise among developing countries, which now have people of very high quality.

35. The Group may wish to support these recommendations or put forward new ones.

Port organization and administration: a noteworthy experiment in Morocco (UNCTAD/SHIP/627)

36. In 1984, Morocco embarked on a complete overhaul of its port policy with a view to achieving a better distribution of activity between the different ports, preventing Casablanca from getting overcrowded, making each other port a centre of development in its region and improving the operation of port equipment, which has been upgraded. For this purpose, a port authority, ODEP,

was set up as a public body, and tasks calling for government action were assigned to the administration. A flexible position was adopted towards the private sector, allowing for future developments, which might if necessary see a strengthening of its position.

37. The Port Operation Office (ODEP) gave priority to a programme for carrying out the most urgent work and proceeded to reorganize the structure and mode of operation it had inherited from the old Independent Authority of the Port of Casablanca. This reorganization concentrated on three main areas: use of human resources, improvement of equipment and a policy for service quality and user relations, with a prominent place given to training.

38. By the end of 1987, the new organization had been set up. It is based on the principle that operations should be largely decentralized to units close to users (independent production centres) and that the managers should take financial responsibility for operations at the various ports, which are intended to be profit-making. The task of the central authority is to formulate the enterprises' policy and strategy, to co-ordinate, to preserve the necessary balance and redistribute resources as necessary, without getting involved in operations. Motivation, promotion of awareness, training and circulation of information help to create a favourable climate. The results achieved are highly positive: increased productivity, user satisfaction, more traffic.

39. This reform contains many elements of interest to the international port community. Further information could be provided at the Group's meeting on the Moroccan experiment, the difficulties encountered with it and the lessons drawn from it by the Moroccan authorities. The Group may perhaps also wish to have a broader exchange of views on the highly topical subject of the modernization of port organization and management.

II. TRAINING AND TECHNICAL CO-OPERATION IN THE PORT FIELD

(agenda item 4)

A. Port training

Introduction

40. UNCTAD has issued a number of documents on its technical assistance and training programmes, including:

"UNCTAD programme of technical assistance and training in shipping, ports and multimodal transport" (UNCTAD/ST/SHIP/10);

"Port management training: UNCTAD's approach" (TD/B/C.4/AC.7/3).

The past

41. The Shipping Division began training activities in the port field in 1972 with bilaterial and international financing. To begin with, these activities were intended for senior officials, and many courses and seminars were organized in a large number of developing countries. In 1980, however, UNCTAD gave a new direction to its training activities, launching two new programmes to help developing countries become independent as soon as possible in this field of training which is so important for successful port operation and development. These programmes are: (a) Improving Port Performance (IPP), financed by Sweden (SIDA), and (b) TRAINMAR, financed by UNDP and other sources. A list of the courses and seminars offered by these two projects is given later on.

42. The aim of these two programmes was to try out a new approach to training so as to reach a greater number of port staff, at a lower cost per head, while maintaining quality and strengthening local capacity. TRAINMAR introduced an additional element by encouraging the development of co-operative activities among training centres. The main difference between TRAINMAR and IPP is administrative, their sources of finance being different. IPP produces courses and makes them available to the international port community, on very easy terms for the developing countries, which also get assistance in training trainers. TRAINMAR has set up an international network of training institutions, enabling them to take advantage of the opportunities for exchanges of teaching material and staff among institutionalized training centres and permanent members of the network.

43. In 1989, specific evaluations were made of these projects, together with an overall evaluation of the Shipping Division's technical assistance and training programmes. The conclusions and recommendations of these evaluations 1/ bring out the fact that UNCTAD's courses for senior managers need no (or very little) adaptation to local port conditions. On the other hand, the courses for middle or junior managers, which relate more to specific

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1/ They can be found in the document "Evaluation of the technical co-operation programme in the field of maritime and multimodal transport" (TD/B/C.4/331 and Add.1).

tasks, often need considerable adaptation. Hence courses of the first type are more suited to what the IPP project can do, while those of the second kind fit in better with the TRAINMAR project.

The future

44. In the light of these recommendations, a new approach has been developed to IPP's and TRAINMAR's port training activities, with a view to combining the two in an attempt to meet countries' needs better. It consists in offering, in each of the main fields of port management, a fully co-ordinated set of courses covering the full range of needs.

45. This new approach has begun to be applied in practice in the field of port equipment. The research done by UNCTAD and the World Bank on this topic, one result of which is course IPP-3, "Port equipment: policy, management and maintenance", showed that there were eight specific fields of action to be considered in dealing with the matter. It was therefore decided that TRAINMAR's and IPP's present and future courses should cover those fields in a co-ordinated fashion, their technical content being based on IPP-3. That is the case with TRAINMAR's present courses 02.9, "Management of equipment maintenance", and 02.18, "Spare parts management", which cover two of the eight fields identified for action to promote successful management of port equipment. Naturally, these courses will have to be adapted to the specific conditions in the countries and ports where they are given. They will supplement the more general training given in the IPP-3 general policy seminar. Equipment procurement is another of the eight fields identified, and a course being prepared on this subject in the IPP series will thus fit into this general approach when it is finished. As it has been designed for middle managers, it will have to be adapted to local conditions.

46. In this new training strategy, there is room for other training activities organized by other organizations, countries or consultants, in order to meet all the needs of the population concerned. It is only when all needs are properly met that satisfactory results can be achieved.

47. In the near future, a similar strategy will be applied to other port activities, operations, economics - matters which are of great interest to many developing countries. UNCTAD has already produced studies setting out the basic principles to be followed in these fields, which will guide future training activities.

48. It should be added that traditional seminars are still being organized, having given good results in the past. Thus, periodically UNCTAD organizes a seminar with the port of Antwerp (APEC) on container terminal management and seminars with the port of Le Havre on tariffs and accounting.

49. In addition, some training fellowships are offered every year for managers from developing countries, either under country technical assistance projects (as was the case with Côte d'Ivoire) or under the JOBMAR programme, which is designed to encourage this type of operation.

50. To conclude, it may be noted that co-operation between the main agencies in the United Nations system in the field of port training has been strengthened by the work of an IMO/UNCTAD/ILO working group. For example, IMO has recently produced a course on port management which it will be putting out jointly with UNCTAD in the next few months.

51. There follows a list of the main IPP and TRAINMAR port courses:

Code	Title	Duration (weeks)	Languages A	C	E	F	S	P
IPP Seminars and courses								
IPP-1	Management of general cargo operations	4	X	X	X	X	X	X
IPP-2	Container terminal development policy	1			X	X	X	
IPP-3	Port equipment: policy, management and maintenance	1			X			
TRAINMAR seminars and courses								
T2.1	Port planning	4			X	X	X	
T2.2	Port operations for supervisors	4			X	X	X	X
T2.3	The port and its users	1			X	X	X	
T2.4	General cargo operations in a a port section	2			X			
T2.6	Management of container terminal operations	3			X	X	X	X
T2.7	Port administration for supervisors	4			X			
T2.8	Financial management in ports	2				X		
T2.9	Management of equipment maintenance	2			X	X	X	
T2.10	Cargo storage and warehousing	2				X		
T2.11	Management of small ports	2				X		
T2.12	Use of computerized information systems in ports	2			X			
T2.13	Improving supervisory management	2				X		
T2.16	Management of contract works	2			X			
T2.17	Port pricing	1			X			
T2.18	Spare parts management	2			X			

52. The Group may wish to make specific recommendations on UNCTAD's port training activities and the new directions they have taken.

B. Technical co-operation

53. In 1968, the General Assembly designated UNCTAD as one of the executing agencies for technical assistance programmes financed by UNDP. Subsequently, the Committee on Shipping adopted decisions and resolutions requesting the secretariat to give these activities high priority. UNCTAD can help port authorities in developing countries and give them technical advice and assistance through the Ports Section of the Shipping Division. This technical assistance is provided by experts and consultants, who are found, recruited and supervised by the secretariat, which also, when necessary, engages firms of consultants, organizes courses and fellowships and arranges for the purchase of equipment. However, UNCTAD has no specific budget for technical assistance, and all the costs involved therefore have to be financed by UNDP, by bilateral or other sources of assistance, and sometimes, in whole or in part, by the recipient countries themselves.

54. The technical assistance programmes now being undertaken by the Ports Section, sometimes in co-operation with other organizations, are concerned particularly with port organization, administration, management, operation and development, including efforts to increase port authorities' or enterprises' technical competence in planning, pricing, general and cost accounting, use of computers, and establishment or development of training institutions. Joint projects are undertaken with ILO and IMO when the requirements come within their sphere of competence. The following list gives further information on projects under way:

Port projects undertaken by UNCTAD

Creation and strengthening of Port Authority	Haiti	HAI/86/006
Training project, Netherlands-financed	Tanzania	RAF/89/A04
Training project, Canadian-financed	Yemen	INT/82/A10(G)PDY
Training component	Ethiopia	ETH/89/014
Integrated project covering the whole sector		
Shipping and port studies, organization and management	Côte d'Ivoire	IVC/82/004
Port administration and organization		
Development of human resources and institutions in African ports	Several countries	RAF/89/028
New projects		
Port training and transport	Democratic Yemen	PDY/86/010
Port development	Democratic Yemen	PDY/89/018
Reorganization of Port-au-Prince	Haiti	HAI/89/030
Port training (TRAINMAR)	Haiti	HAI/89/022
Port pricing and procedures	Oman	OMA/90/011

III. FUTURE WORK PROGRAMME OF THE SECRETARIAT

(agenda item 5)

55. In the past, the secretariat's activities were divided in a balanced way between the preparation of studies and meetings, technical co-operation and training. It is suggested that this balance should be preserved in the future, because it provides a guarantee that the work done will be of good technical quality, as these activities are mutually complementary. Future guidelines for technical assistance and training activities will emerge from the comments made by the Group on agenda item 4, which deals with these subjects.

56. As far as future studies are concerned, the following subjects would seem to be worth considering:

Port organization and administration

57. This is a subject of current interest in many ports, as was shown by the comments received on the study dealing with the Moroccan experience and on an article published by the Chief of the Ports Section on some guiding principles of port organization, operation and development. This work could be continued and used as the basis for a specific publication, because it is clear that while each port has its own particular characteristics, there are a number of basic principles in this field which are applicable to all ports. The experience gained in technical assistance projects, particularly a study of institutional aspects and human resources development in African ports, could be made use of.

Human resources development

58. This is also a topical theme, but it is often not properly understood. Its importance for the future of any port is very great. By human resources development is meant the functional activities of planning, producing, managing and evaluating an organization's staff. By "producing" is meant recruiting and training. The term "management" covers the activities traditionally undertaken by supervisory staff. To this should be added a review of the organization, to make sure that the staff have a proper framework to operate in. It is more than ever evident that the future quality of ports will be directly dependent on the quality of the staff and their ability to adapt themselves and their port to traffic requirements - hence the importance of this subject.

Strategic planning

59. This is a new idea, and one which very much meets a need, since it enables planners to make better preparation for the future while allowing for the uncertainty besetting any forecast of port traffic. Traditional port planning had many advantages, but it was perhaps too rigid, often doing no more than take high and low estimates of future traffic in order to introduce the idea of uncertainty. Strategic port planning brings in this idea of uncertainty, or risk, from the outset and uses it to redirect port development in such a way that new factors can be turned to advantage, rather than simply gone along with.

Development of the commercial function and promotion of the port area

60. Modern ports are important development nuclei for the economies of their regions and countries. The port area is a place with special advantages, since the principal agents involved in transport and even international trade are to be found there. Every port thus has a natural vocation to help attract new traffic and open up new markets. Trade takes place in an atmosphere of intense competition, and through their dynamism, their performance, ports can help in getting the edge on costs which makes the difference between gaining or losing a market. The development of intermodal and integrated transport can only reinforce this tendency and this need to have one of the links in the transport chain - in this case, the port - working for the improvement and development of trade.

Legal and regulatory aspects of port questions

61. Too often ignored, sometimes mishandled, these aspects of port activities might be worth giving special study. The field is a vast one, and the influence of national legislation and regulations, of local practices, might limit the range of a study intended for all ports. The Group may wish to look into this question and decide whether or not it is desirable to make a study of the subject, limiting it perhaps to the general principles that ought to be included in regulations on port operation, or in any document, regulations or code concerning the organization and operation of ports.

Relations between port and town

62. The International Town and Port Association deserves credit for focusing attention on the special link between the port and the town which often brought the port into being. The relations between these two partners, which were necessarily harmonious in the days when the port acted as the town's lungs, are now sometimes less close, with the port growing up at a distance from the town. Certain specific problems have thus arisen from this development and modernization of ports, particularly the problem of what to do with port sites that are no longer needed. But the future development of the port and its role as an engine of growth for the port area and its trade should lead to a strengthening of links between port and town and enable the two of them, which have sometimes been temporarily at odds, to undertake many activities in conjunction.

Updating of former studies

63. Some of the secretariat's studies have been very successful but are beginning to show their age. It might be desirable to bring them up to date. This concerns in particular the following, which were published over 15 years ago:

Port statistics (TD/B/C.4/79)

Port pricing (TD/B/C.4/110).

Other activities

64. Among the other activities which the Group could consider for inclusion in the future work programme, mention should be made of:

(a) The other studies already suggested for a later stage at the first meeting in 1986;

(b) Publication of the port bulletin and operation of the network of focal points;

(c) The possibility of arranging a new meeting of the Group of Port Experts at a date to be decided.

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Item 3 of the provisional agenda

DEVELOPMENT AND IMPROVEMENT OF PORTS

Co-operation among ports in developing countries

Report by the UNCTAD secretariat

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Extremely useful ( ); Very useful ( ); Useful ( ); Marginally useful ( ); Not at all ( ).

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	Outstanding	*Excellent*	*Good*	*Adequate*	*Poor*
Presentation and readability	( )	( )	( )	( )	( )
Originality of ideas	( )	( )	( )	( )	( )
Wealth of information	( )	( )	( )	( )	( )
Up-to-date information	( )	( )	( )	( )	( )
Technical accuracy	( )	( )	( )	( )	( )
Quality of analysis, including objectivity	( )	( )	( )	( )	( )
Validity of conclusions	( )	( )	( )	( )	( )
Clarity of recommendations	( )	( )	( )	( )	( )
Comprehensiveness of coverage	( )	( )	( )	( )	( )

6. **Other observations** *(if any)* . . . . . .

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Finally, we would appreciate it if you could provide the following information about yourself:

Name . . . . . Occupation/Functional title . . . . . .

Address . . . . . .

Your answers are for internal use and will be kept confidential. Thank you for your co-operation.

Please forward the questionnaire to : PROGRAMME CO-ORDINATION AND EVALUATION UNIT
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I. INTRODUCTION

A. Mandate received by UNCTAD secretariat

1. In decision 54 (XI) of 30 November 1984 the Committee on Shipping requested the Secretary-General to convene an ad hoc intergovernmental group of port experts to consider various topics, including technical co-operation between ports. In order to facilitate the group's work, the secretariat subsequently prepared document TD/B/C.4/AC.7/4 dated 11 December 1985 and entitled "Co-operation between ports".

2. The document identified possible spheres for co-operation, and in particular the following:

- Development of transshipment ports. The advantages of joint action were considered together with the possibility of intergovernmental agreements on the choice of a common transshipment port and the type of clauses that might be inserted into contracts between the operators of the transshipment facilities and the port authorities;

- Harmonization of port statistics, to permit managers better to evaluate the performance of their port and better to determine joint investments;

- Harmonization of port tariffs, in particular in terms of structure, in order to facilitate calculation of and comparison between transport costs;

- Joint dredging and marine salvage operations in order to diminish the relevant costs;

- Technological expertise exchange which would yield major benefits for small ports in particular;

- Training, in order to reduce its cost and improve its quality, following the example of the TRAINMAR and IPP programmes.

3. Other possibilities for co-operation were also mentioned, in particular the establishment of regional research centres, the establishment of a spare parts exchange pool, regional co-operation for trade facilitation, pollution control, foreign investment in the purchase of equipment, equipment recycling and the sister port scheme proposed by the International Association of Ports and Harbours in 1979.

4. Accordingly, the Ad hoc Intergovernmental Group of Port Experts, which met in Geneva between 25 February and 5 March 1986, examined the report under item 5 of its agenda. It recommended that Governments should encourage ports to co-operate and their managers to participate in the activities of regional and international organizations. It also invited the secretariat to encourage regional co-operation to avoid superfluous investment and improve relations between ports and users.

5. In resolution 61 (XIII) of 22 March 1988, the Committee on Shipping invited the Secretary-General of UNCTAD again to convene an ad hoc intergovernmental group of port experts to review, inter alia, the possibilities for regional co-operation in developing countries in the field of ports, with a view to ensuring the best use of scarce resources. The secretariat was also requested to propose follow-up action appropriate for local, national and intergovernmental consideration. This report has been prepared to facilitate the work of the Ad Hoc Group of Port Experts on this topic.

B. Other work by UNCTAD in the sphere of co-operation among ports

6. As early as 1983, the Group of 77 requested UNCTAD secretariat to prepare a draft programme of action for co-operation among developing countries in the areas of shipping, ports and multimodal transport. As that request was confirmed by UNCTAD VI, the Draft Programme was submitted to the eleventh session of the Committee on Shipping in November 1984. 1/ In resolutions 53 (XI) and subsequently 60 (XII) the Committee requested the Secretary-General to convene a meeting of an ad hoc intergovernmental group of senior officials to examine in greater depth the Draft Programme of Action and the issue of co-operation among developing countries in various spheres, including ports. The Group of Senior Officials examined the report prepared by the secretariat on the subject (TD/B/C.4/AC.9/2) and adopted a resolution in which it invited Governments of the developing countries, and in particular the port authorities to co-operate with each other and to promote transshipment services in ports where it was feasible and to upgrade training institutions in order to develop management training schemes therein on a regional or subregional basis.

7. After having examined the issue at its thirteenth session, the Committee on Shipping requested, in decision 63 (XIII), that a further meeting of a group of experts be convened on the same topic. Accordingly, in 1989 the secretariat prepared a specific report 2/ based on two documents 3/ which set out the experience of the countries of the European Economic Community (EEC) and of the Council for Mutual Economic Assistance (CMEA) in the sphere of co-operation in shipping, including co-operation among ports. These documents show that co-operation in the ports field has developed slowly in the EEC countries, in particular with regard to the development of a joint ports policy and the co-ordination of the port investment necessary to meet the needs of technological change. In the CMEA countries co-operation among ports has developed through assistance measures to develop port facilities either in developing countries (Viet Nam, Cuba) or in transit ports (Rostock) serving land-locked countries (Czechoslovakia). Dredging operations and shipping aids have given rise to co-operation agreements, as well as exchanges of information and the establishment of structures for co-operation to improve port operations, such as INTERPORT, set up by Poland and the German Democratic Republic.

8. The Group of Experts on Economic Co-operation among Developing Countries in Shipping, Ports and Multimodal Transport which met in Geneva from 26 to 30 June 1989 essentially focused its recommendations on shipping. As far as ports were concerned, countries were encouraged to co-operate in setting up and financing transshipping facilities on a regional basis. However, most of the general recommendations adopted also applied to the ports sphere and in particular those relating to information exchange, surveys and research, joint

ventures, building up of computer systems, training, transfer of know-how, policy formulation, legislation, harmonization and simplification of procedures and participation in regional or international structures for co-operation. Further details may be found in the relevant report. 4/

9. It will be apparent from this long review of the action already undertaken in this area by UNCTAD that co-operation among ports is an issue of top priority for policy-making bodies. However, the actual forms in which it has been implemented do not appear fully to have satisfied expectations, although the appreciable results already obtained should not be minimized. In an attempt to narrow the gap between expectations and actual achievements this report will further develop the study of already familiar areas in which co-operation among ports is desirable, in order to put forward practical recommendations to develop it further, particularly among the developing countries.

II. SURVEY CARRIED OUT BY THE SECRETARIAT

10. As the field of application for measures involving co-operation among developing countries in the ports field has already been defined by previous studies, the need has emerged for a more searching analysis of the main topics identified. In order to do so, a survey was carried out.

11. Two questionnaires were prepared, one addressed to ports and the other to regional and international port associations. A distinction was made between a regional and an international port association. The former was defined as that covering ports on a coast or geographical area served by the same conferences or shipping lines while the latter includes ports on one or more continents. In the hope of having as high a rate of responses as possible the questionnaires were addressed to the "focal points" set up in 1987 following a recommendation of the Ad Hoc Intergovernmental Group of Port Experts.

12. A total of 59 country "focal points" and 11 "regional focal points" were contacted in the survey. The geographical distribution, and the languages used, for the "country focal points" are given in table 1 below. All "regional focal points" were contacted in English and their names and geographical coverage are given in table 2 below.

Table 1

Geographical/language distribution of the survey (countries)

Region	Actual	Percentage	Languages	Actual	Percentage
Africa (ECA)	30	51	English	38	64
Latin America and			French	16	27
Caribbean (ECLAC)	9	15	Spanish	5	9
The Gulf (ESCWA)	4	7			
Asia and the Pacific (ESCAP)	10	17			
Other countries a/	6	10			
Total	59	100	Total	59	100

a/ China, Cyprus, Finland, Turkey, United Kingdom and United States

Table 2

List of "regional focal points" and their geographical coverage

Name of the association	Geographical coverage
Eastern Caribbean Ports Association	Eastern Caribbean
PMA of Eastern and Southern Africa	Red Sea and Indian Ocean
PMA of West and Central Africa	Atlantic Ocean
South Pacific Ports Association	South Pacific (Oceania)
Gulf Port Management Association	Arab ports on the Gulf
Federation of Arab Seaports	All Arab ports
American Associations of Port Auth.	America
COCATRAM	Central America
Asociación Iberoamericana de Puertos	Latin America, Spain, Portugal
PIANC	The world
IAPH	The world

13. Thirty-four replies were received to the questionnaire addressed to country focal points (58 per cent). Eight replies were received from associations (70 per cent). As table 3 shows, replies from Africa made up more than half of the total answers, while those from Asia and the Pacific reached 20 per cent.

Table 3

Percentage of replies by geographical area and language

Region	Actual	Percentage	Languages	Actual	Percentage
Africa (ECA)	20	59	English	21	62
Latin America and			French	10	30
Caribbean (ECLAC)	3	9	Spanish	3	8
The Gulf (ESCWA)	1	3			
Asia and the Pacific (ESCAP)	7	20			
Other countries a/	3	9			
Total	34	100	Total	34	100

a/ Cyprus, Turkey and United States.

14. A sample of the questionnaire addressed to countries, including the number of replies given to each question, is given in Annex 1. The questionnaire has 10 questions which can be considered broadly grouped in three parts. The first part, comprising questions 1 to 4, attempts to determine the degree of participation, if any, of port organizations in the working of the regional associations, which is presumed to be participation in the meetings convened from time to time. The second part, comprising questions 5 to 9, tires to assess whether the role of the associations is perceived as more than periodic gatherings to discuss matters of common interest, the outcome of any co-operative activities that may have been undertaken on these occasions and the relevance of regional associations in relation to those of an international nature. Finally, question 10 constitutes the third part of the questionnaire; it enabled countries to provide additional information on the impediments to co-operation, areas in which it could evolve, and successes, if any, to date.

15. The reply to the first part of the questionnaire shows that the vast majority (28 out of 34) of port organizations which replied to the questionnaire are, indeed, members of a regional port association. Further, 24 of them have a membership which is at least 10 years old, while 21 have participated in more than two meetings during the last two years. Participation in these meetings is not regarded as unimportant since 21 countries answered that they participated with two or more delegates. The definite answers given to these questions shows, clearly, that the countries actively participate in the working of the regional port associations they decided to establish, in many cases, more than 10 years ago.

16. Further, in replying to the second part of the questionnaire, countries almost unanimously stated that they perceived the role of the association as more than simply organizing meetings. About two thirds of them (22 out of 34) mentioned that they have attempted in the past to start co-operative ventures as a result of their participation in the association. Although the replies

show that the result of the co-operation so far undertaken has not always been conclusive (15 considered it a success while 7 said the result was inconclusive), they also show that countries strongly beleive there is scope for regional co-operation (24 out of 27 support this view). Further, as the replies to question 6 show, countries do not see a definite advantage of a regional association vis-à-vis an international one; therefore co-operation between ports could be undertaken on either a regional or an international scale according to circumstances.

17. As expected, the replies given to question 10, the third part of the questionnaire addressed to countries, were very broad. To have a coherent picture they have been condensed in three tables. Table 4 refers to the impediments which preclude co-operation between ports while tables 5 and 6 list the suggested areas for co-operation and the success to date, respectively.

18. Table 4 calls for two remarks. First, there are several reasons which impede co-operation between ports. There are a total of 17 "reasons" listed in table 4, including the 3 mentioned only once under the heading "other reasons". Second, the number of times a particular "reason" is referred to in the table does not imply that absolute priorities exist. Some of the answers have been grouped under one "reason" because they corresponded to the idea implied by this reason. Notwithstanding the above, it is possible to draw some conclusions from the information in the table by noting that some of the "reasons" could be regarded as either intractable or requiring action from decision-makers outside the transport field. To this category belong: language problems; conflict between countries; communication difficulties between neighbouring countries; competition beween ports; and institutional differences. Further, in spite of the diversity implied by the remaining

Table 4

Impediments to co-operation

Identified reasons which impede co-operation between ports	Number of times referred to
Lack of money	9
Lack of political/real will	5
Lack of or unsuitable structures for co-operation	
Competition between ports	4
Conflict (political)	3
Institutional differences in administration	3
Insufficient communications links between countries	3
Different languages	3
Unclear government policies	2
Decision-makers are unaware of ports importance	2
Differences in documentation/legislation	2
Poor/unsustained co-ordination of projects	2
Shortage of high-level manpower	2
Other reasons a/	3

a/ Under this heading are: over-ambitious projects, excess of bureaucracy, and the mistaken idea that help from a big port is better.

"reasons" it is possible to find common ground among them, namely, that to a certain extent remedial action at a port or transport level is feasible. To this category belong lack of awareness by national decision-makers of the role of ports, lack of money, poor co-ordination of projects, and shortage of high-level manpower.

19. The list, given in table 5, of suggested areas for co-operation is long and spreads over several fields. There are three points to be noted. First, the answers seem to imply that more effort is needed in the field of training, in spite of the considerable effort made in this field in recent years. Second, as co-operation covers the whole port sector it follows that there is a need for co-ordinated inputs by international agencies. Third, the list confirms some of the suggested areas for co-operation put forward in earlier UNCTAD documents while indicating additional areas such as marketing and promotion, and automation.

Table 5

Suggested areas for co-operation

Suggested areas for co-operation between ports	Number of times referred to
Training	12
Harmonization and/or exchange of tariffs	7
Common service for collecting/analysing/dissemination of information	6
Navigation and pollution matters	4
Technical expertise exchange	4
Dredging	3
Harmonization of statistics	3
Harmonization of operational documents/procedures	2
Evaluation/utilization of ports at a regional level	2
Computers	2
Undertake studies on cost-sharing basis	2
Relationship ports users (including conferences)	2
Marketing and promotion	2
Other suggestions a/	11

a/ Under this heading are: monitoring cargoes among ports on the same coast; mechanisms for discussing matters of common interest; accountancy procedures; provision of technical services on a cost-sharing basis; automation security and harmonization of equipment maintenance procedures and management techniques; and finally the undertaking of projects of common interest, without specifying the project, was referred to three times.

20. Table 6 lists the successes in the field of co-operation. However, the list should be completed by two answers received that mentioned lack of success and limited success respectively. The success in the field of training is perhaps a reflection of the considerable activity of international agencies in this field recently. Harmonization of tariffs and statistics is then mentioned and finally the fact that Port Management Associations are active has been regarded as a success.

Table 6

Successes to date

Successes to date	Number of times referred to
Training	9
Harmonization of tariffs	4
Harmonization of statistics	2
Harmonization of navigational aids	2
Existence of Port Management Associations	1
Setting up of a fund for port assistance	1
Hosting a day meeting to make propaganda	1

21. The answers of the associations complemented those given by countries in several ways. The membership of the associations is not generally restricted to port authorities, as was the case with most of the quetionnaires addressed to countries. Thus, it was found that in some regional associations cargo-handling companies, shipping companies and other cargo-related entities were part of the association, whereas some international associations have educational institutes, government agencies and consultants as part of their membership. Secondly, the variety of arrangements which assure the functioning of the associations confirms that a suitable structure for co-operation is not a straightforward matter. Regional associations showed a large diversity of arrangements: a full-scale secretariat; a member acting as a secretariat; and finally, a United Nations Commission acting as a secretariat. International associations, on the other hand, always have a full-scale secretariat. Thirdly, almost complete unanimity was found as to the need to strengthen co-operation; in effect, the associations have been engaged in activities broader than the mere organization of meetings. They perceive that co-operative activities between members can be fostered. International associations have elaborated schemes which they have put into operation to match needs in developing countries with expertise available in more developed ports. These schemes, which are monitored by special and permanent committees within the associations, have been active for some years; however there is still room for improvement. As to impediments, the associations mentioned lack of funds, different languages, different institutional arrangements, communication problems due to geography or poor links, as the major impediments - thus confirming the views expressed by countries.

III. ANALYSIS OF THE INFORMATION COLLECTED

A. Main impediments to co-operation among ports

22. The lack of financial resources was cited by several countries and organizations as one of the main factors impeding the development of co-operation. This finding is highly instructive as it reveals a state of mind. Port authorities generally possess considerable material resources originating from port dues. The operational nature of port activities endows such authorities with a degree of autonomy which is in general sufficiently broad to allow them, if they consider it necessary, to commit a certain amount of current expenditure, including such expenditure as is necessary to develop co-operation with other ports, to visit them and together to determine harmonized or joint programmes of action. However, the fundamental problem is that the genuine benefits that such co-operation would entail are not always adequately identified, or even quantified, to encourage managers to earmark the limited expenditure necessary. Lack of funds does not constitute a genuine reason for the scant development of co-operation but rather an indicator of the concern on the part of authorities not to commit themselves to co-operation without a minimum guarantee that it will lead to positive results.

23. Competition among ports is another factor that appears to have impeded the development of co-operation. In many cases, such competition among ports is very real. It is as old as the ports themselves, and occurs at several levels - international, regional and national. Nowadays it is undoubtedly fiercer than in the past. Competition is often a spur for ports to be more efficient and cheaper. It is undoubtedly a factor that genuinely impedes the development of co-operation. However, closer analysis reveals that it applies to a limited sphere and that there are areas and types of co-operation, ranging from concerted action through co-ordination to more advanced types of integration, in which joint ventures are possible while remaining compatible with the principles of sound and healthy competition.

24. The lack of political will for co-operation, together with the absence of structures for co-operation, were also cited as factors impeding co-operation. The first factor is valid for certain regions in which there are conflicts between countries, although such a situation is exceptional. At this point it is worth illustrating the opposing thesis: in some regions in which there has been and still is tension among neighbouring States, such as Central America, it is indeed a quite remarkable fact that the port authorities, through their port associations (in this case COCAAP 5/ and COCATRAM 6/) have met without interruption, consulted one another and developed joint measures for co-operation, in particular in the sphere of training. The numerous requests filed by political authorities for UNCTAD to promote co-operation among ports is a further indication of the political will to do so.

25. The lack of structures for co-operation undeniably accounts for the lack of co-operation among ports. Thus, in Africa, it has to be acknowledged that co-operation among ports was considerably strengthened following the establishment, thanks to the efforts of the Economic Commission for Africa, of

regional ports management associations in the 1970s. These associations have provided an appropriate framework endowed with permanent but light-weight structures, which has made it possible to undertake numerous research, training, co-ordination and co-operation activities.

26. The other reasons mentioned are too diverse to be dwelt upon. However, attention should be drawn to the genuine problem of linguistic barriers, the lack of practical communication links between countries and the different administrative and operational structures, which give rise to differences in the functions and role of port authorities from one country to another, a factor which of course does nothing to facilitate closer links and co-operation among ports.

B. Main areas in which co-operation among ports may be developed

27. The earlier studies and the survey carried out indicate that of the areas considered for the development of co-operation among ports, the one that was looked upon with the greatest favour was training. This finding confirms the work carried out and the experience acquired by UNCTAD over some 20 years in this field. Many ports have set up local or national training machinery, although the population requiring training is frequently too small to justify the minimum investment in premises, equipment and personnel to allow a centre to operate. In this area as in others, there is a "minimum critical mass" below which the establishment of a national training centre cannot be justified on economic and technical grounds. Port authorities have occasionally addressed themselves to other national partners, within the shipping sector or outside it, in order to establish sectoral training centres. Regional co-operation also offers very good prospects in this field. It opens the way to a broad range of measures extending from just the exchange of information to the establishment of regional training institutions, such as regional maritime academies.

28. Co-operation facilitates adjustment to the requirements of a better quality/cost ratio. It makes it possible to adopt a joint or harmonized approach to training questions and to benefit from the latest developments in the area, which is of particular importance for the future of ports. In particular, this applies to questions of methodology and the preparation of training plans, training of trainers (instructors, course designers, training managers) and integration of training measures within a broader plan for the development of human resources. If there are regional training structures or agreements it is possible to draw up full-blown regional training plans by organizing, for example, the production, adaptation and dissemination of courses or traineeships on a regional basis if national requirements are inadequate to justify measures at national level. This is often the case with training for trainers and for managers responsible for planning, tariff rates, statistics and accounts. Regional co-operation in the sphere of training frequently constitutes the first step by ports towards more ambitious co-operation measures.

29. UNCTAD has been active in developing such co-operation among ports in the training field. Its IPP (Improving Port Performance) programme has made it possible to provide high-level courses on a regional basis. Its TRAINMAR programme was designed to encourage the creation of local training structures located within a regional co-operation network together with machinery for co-ordination and co-operation (resource centres acting as focal points

and providing support for national centres, regional educational committees, etc.). The national and regional centres also co-operate at international level through the exchange of courses and instructors. IMO has also pursued the same objective through the creation of the World Maritime University in Malmö and its network of associated regional centres. A similar enterprise has been undertaken by ILO, in particular for dockworkers, through the creation of a regional network for co-operation in Latin America. Similar steps have been taken by other international bodies, including the regional economic commissions, financial organizations, associations of international and regional ports, regional training institutes, specific donor countries and international consultants. Every effort should be made to ensure that these efforts are continued, intensified and co-ordination among them perhaps reinforced by means of flexible machinery that would not interfere with the dynamism and autonomy of the measures under way, while making it possible to harmonize the methodologies employed and the regional co-operation networks.

30. A number of technical topics have been identified as capable of giving rise to joint measures involving various ports. The two topics most frequently mentioned as having provided a basis for successful co-operation were port tariffs and port statistics and information. As an illustration, the port authorities of Central America and West and Central Africa have requested UNCTAD and UNDP, through their regional port organizations, 7/ for assistance in these two spheres. That request has been met with some degree of success. It is in the interest of all ports in a given region to undertake specific actions with regard to the exchange of information and co-operation in tariff matters. A clearer definition and harmonization of the tariff basis, discussed and sometimes adopted at regional level, makes for higher revenues, contributes towards improved use of installations and facilitates the task of forwarding agents and shippers. Thus, in some regions the unit on which the tariffs charged to ships is based has been seen to evolve from gross tonnage, which is not particularly significant and gives rise to all kinds of anomalies, towards a unit more representative of the volume of the ship and the extent to which it uses port facilities. In contrast, the manner in which the rate of each port charge is set is one of the key elements in any properly designed port policy in order to cover costs and ensure proper use of the port. Accordingly, it is not possible to set it on a regional basis. It should be noted that in some regions an effort has also been made to harmonize port accounting systems, as well as cost control systems by aiming to apply to other ports the results achieved in one port in the region. This has been the case in West and Central Africa on the basis of the work carried out by the port of Abidjan.

31. Interesting results have also been obtained in the above regions through the harmonization of statistical systems and port-productivity indices. It should also be noted that ESCAP, which is active in the ports sphere, has also made considerable efforts to harmonize port tariffs and statistics at regional level.

32. As an example of other topics on which attempts at co-operation among ports have focused we may cite investment planning. However, it always proves extremely difficult to obtain an agreement by the parties concerned to allow a port to stand out from the rest and play a major regional role, for example, as a transshipment port. Nevertheless, port authorities might be encouraged to continue to work in this direction in order to avoid a proliferation of superfluous investment. In the hope of attracting new traffic some ports have

too rapidly given way to the demands of their clients who wish to introduce innovations requiring heavy port investment. It is conceivable that the port authorities of the region concerned could consult with one another and request a minimum commitment from their trading partners in search of a site to develop their new activities, in particular a financial contribution towards the construction or the operation of the required facilities, in order to prevent them from being rendered unusable if the partners suddenly leave.

33. Another topic that also deserves closer attention is the pooling of port services or equipment. Dredging equipment immediately springs to mind; the same holds for navigational aids and services and buoy tenders. Mauritania and Guinea entered into an agreement with Senegal, which possessed a buoy tender and performed several annual maintenance operations on the buoys and other navigational aids belonging to the other two countries against a flat-rate fee. The list of potential measures in this area could be extensive: hydrographic services, floating cranes, dry-dock facilities, pool of equipment spare parts, etc.

34. The last topic to be analysed, and which perhaps holds the greatest potential for the future development of co-operation among ports, in particular in developing countries, is the transfer of technical expertise. Most ports, including those located in the industrialized countries call on consultants for assistance in performing their various management and development functions. These consultants frequently come from other ports, generally in the developed countries. However, nowadays a number of developing countries possess highly qualified managers, in terms both of their university or other training and of their skill and technical experience in a number of spheres, including those into which the latest technological innovations have made their entry. UNCTAD secretariat has used the services of such experts on several occasions to the complete satisfaction of all concerned. Consequently, it seems advisable for port authorities, international consultants and organizations carrying out technical assistance operations to try harder to identify and make use of managers from ports in developing countries. However, care should be taken to avoid going from one extreme to the other. If port consultancy missions are to be successfully carried out, the required technical skills alone are insufficient: it is also necessary to know how to make use of them, how to listen, how to convince. Such skills are sometimes inborn, but they can also be acquired. One possibility would be for ports associations to establish, in conjunction with UNCTAD and the other agencies concerned, methods for identifying and selecting the available technical expertise in the ports of the region concerned. Each potential candidate could perhaps initially serve a probationary period (for example, in the form of a mission as an assistant consultant in an international team) before being given the status of international consultant.

IV. CONCLUSIONS AND RECOMMENDATIONS

35. For many years the topic of co-operation among developing countries as regards ports has regularly been raised in governmental bodies and in particular in UNCTAD, as well as in other quarters, particularly at meetings of port associations. This report has described the history of the efforts made to develop co-operation among ports. A survey has also been carried out by UNCTAD secretariat, as a result of which it has been possible to identify and analyse both the main potential impediments to such co-operation and those areas in which co-operation among ports could be satisfactorily developed.

36. In its mandate to the secretariat, the Committee on Shipping requested it to propose follow-up action appropriate for local, national and intergovernmental consideration. A number of recommendations have already been made in the foregoing sections. However, particular emphasis should be placed on a limited number of proposals thanks to their great potential for effective action in this field. The following three proposals meet this criterion:

37. Encouraging national port authorities and their Governments to join and play an active role in regional and international port associations. These organizations provide an opportunity for port authorities to get to know and appreciate one another better. Bonds are formed that extend beyond the purely professional and technical realms. Port associations have matured and their periodic meetings provide an opportunity for statements and technical discussions of a very high level. Permanent machinery is frequently established to develop co-operation in connection with promising issues. Under this same heading, it is advisable for port authorities themselves to be able to participate, with the agreement of their Government, in the intergovernmental meetings on ports organized by the United Nations system and by other international or national bodies. If financial difficulties arise, priority should nevertheless be given to regional participation, since it should be easier for the secretariat of regional port associations to attend international meetings and to report on them to the associations' members.

38. Strengthening action for co-operation in the field of training and the development of human resources. In this connection international financial organizations and donor countries should increase their support for port training programmes with a regional focus, and in particular those whose objective is to establish or strengthen regional or international structures or networks designed to facilitate the expansion of co-operation and to become self-sufficient. Measures should also be taken at the international level - possibly at a forthcoming meeting of the Ad hoc Group of Port Experts - to prepare recommendations or suggestions for harmonizing, wherever possible, certain features of port training activities, in particular in the areas of methodology for assessing requirements and the development of teaching material, the terminology employed, strategies and structures relating to regional training activities and their integration into a programme for the development of human resources.

39. Encouraging port authorities in the developing countries to be more willing to send their own port experts abroad and to receive visits from port experts from other developing countries for purposes of technical assistance and training. Financial institutions and international organizations should be invited to facilitate this type of co-operation among ports in developing countries as it holds considerable potential, both for the receiver country, the port of origin and the expert who performs the mission. However, national or regional machinery should be established to ensure the quality of the personnel concerned.

40. By way of conclusion to this survey, it may be stated that there are no valid reasons why co-operation among ports should not be developed, provided it is based on pragmatism and common sense and pursues objectives that match the needs and means of the future partners, within a permanent institutional framework that promotes its development, and possesses adequate resources, i.e. motivated and skilled personnel backed up by the necessary minimum of financial resources, in particular to cover their travel expenses.

Notes

1/ Programme of Action for Co-operation among Developing Countries (TD/B/C.4/273).

2/ "Economic co-operation among developing countries in the field of shipping services" (TD/B/C.4/AC.10/2).

3/ UNCTAD/SHIP/624 and UNCTAD/SHIP/625.

4/ Report of the Group of Experts on Economic Co-operation among Developing Countries in Shipping, Ports and Multimodal Transport (TD/B/C.4/321-TD/B/C.4/AC.10/3).

5/ Central American Commission of Port Authorities.

6/ Central America Commission on Shipping.

7/ COCATRAM (Central American Commission for Shipping), COCAAP (Central American Commission of Port Authorities), and PMAWCA (Port Management Association of West and Central Africa).

Annex 1

Questionnaire for country focal points

Note: A regional association is that covering roughly a number of ports on a coast or geographical area served by the same conferences or liner shipping lines. An international association is that covering ports on one or more continents.

1.	Is your organization a member of a regional association?	☐ Yes ☐ No
2.	For how long has your organization been a member of a regional association?	☐ less than 5 years ☐ between 5 and 10 years ☐ more than 10 years
3.	During the last 2 years, how often was your organization represented at meetings of the association?	☐ one meeting ☐ two meetings ☐ more than two meetings
4.	How many delegates does your organization usually send to these meetings?	☐ only one ☐ two ☐ three or more
5.	Does your organization perceive the association's role as being more than organizing meetings?	☐ Yes ☐ No ☐ Yes, but only on request
6.	Does your organization consider participation in a regional association more rewarding than in an international one?	☐ Yes ☐ No ☐ Sometimes (specify) ... .
7.	Has your organization ever attempted to start a co-operative activity as a result of its participation in the regional association?	☐ Yes ☐ No
8.	If so, what was the result?	☐ Success ☐ Failure ☐ Inconclusive
9.	Considering the above, does your organization feel there is scope for regional co-operation?	☐ Yes ☐ No ☐ only occasionally

10. Please spell out, briefly, the main impediments to regional co-operation, the areas in which it could evolve and the successes, if any, to date.

.....
.....
.....
.....

Questionnaire for regional focal points

1. The association has been in existence for
   - ☐ less than 5 years
   - ☐ between 5 and 10 years
   - ☐ more than 10 years

2. Members of the association are
   - ☐ only port authorities
   - ☐ the above plus cargo-handling companies
   - ☐ the above plus others (specify).....
     .....

3. Meetings are scheduled to take place every
   - ☐ 6 months
   - ☐ year
   - ☐ 2 years
   - ☐ other (specify)

4. During the last 2 years there was/were
   - ☐ one meeting
   - ☐ two meetings
   - ☐ more than two meetings

5. The functioning of the association is assured by
   - ☐ a permanent secretariat
   - ☐ one member at a time on a rota basis
   - ☐ one member at a time agreed after each meeting
   - ☐ always the same member
   - ☐ other (specify) .....
     .....

6. Has the association been involved in activities other than organizing meetings?
   - ☐ Yes
   - ☐ No
   - ☐ only occasionally

7. Does the association perceive its role as more than organizing meetings?
   - ☐ Yes
   - ☐ No
   - ☐ Yes, but only on request

8. Does the association perceive current co-operation between members as enough?
   - ☐ Yes
   - ☐ No
   - ☐ not known

9. Does the association perceive there is scope for further co-operation between members?
   - ☐ Yes
   - ☐ No
   - ☐ not known

10. Please spell out, briefly, the main impediments to regional co-operation, the areas in which it could evolve and the successes, if any, to date.

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.....
.....

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	Outstanding	*Excellent*	*Good*	*Adequate*	*Poor*
Presentation and readability	( )	( )	( )	( )	( )
Originality of ideas	( )	( )	( )	( )	( )
Wealth of information	( )	( )	( )	( )	( )
Up-to-date information	( )	( )	( )	( )	( )
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Comprehensiveness of coverage	( )	( )	( )	( )	( )

6. **Other observations** *(if any)* . . . . . .

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DEVELOPMENT AND IMPROVEMENT OF PORTS

Maintenance of port equipment

Report by the UNCTAD secretariat

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I. INTRODUCTION

1. In the majority of ports in developing countries one of the most difficult management problems continues to be the maintenance of port equipment. In spite of substantial aid programmes, in which the provision of equipment and spares has often been accompanied by advice on maintenance techniques, there are still many ports where the availability and condition of equipment is poor.

2. For this reason the *Ad hoc* Intergovernmental Group of Port Experts at its session held in Geneva from 25 February to 5 March 1986, recommended that the UNCTAD secretariat conduct research and studies in the field of "Maintenance of port equipment". The Committee on Shipping, in its resolution 60 (XII), paragraph 8, requested the secretariat to adapt its work in the light of the *Ad hoc* Group's recommendation.

3. The Committee on Shipping, in its resolution 61 (XIII), invited UNCTAD to convene an *Ad hoc* Intergovernmental Group of Port Experts to review the practical problems which arise in respect of the development, improvement and operation of ports, and, in the light of this review, to examine the three highest priority studies requested at the first session of the Group, among which the third one is :

- maintenance of port equipment

and to propose follow-up action appropriate for local, national and intergovernmental consideration.

4. UNCTAD's research was carried out in collaboration with the Infrastructure and Urban Development Department of the World Bank and the United Kingdom Department of Trade and Industry, as described below. The research soon established that the problem is at its most acute in general cargo operations, particularly for container handling, where efficient maintenance of port equipment, allied to sound equipment procurement policy, is central to port efficiency. Accordingly, this report, while discussing general principles which apply to all classes of port operation, concentrates on the handling of general cargo (in which freight containers play an increasingly important part).

5. A survey of the problem was conducted by a team financed by the United Kingdom Department of Trade and Industry. The team visited seven European ports, and nine ports in developing countries, including visits to Colombian ports financed by the World Bank. They prepared a report which reviewed port maintenance practices and management and which has served as the basis for much of the further work.

6. The World Bank then commissioned a firm of United States consultants to prepare a technical paper on "The management of port equipment maintenance" which built on the United Kingdom team's work and incorporated experience in maintenance of equipment worldwide, in many different industrial sectors.

7. UNCTAD also made use of the United Kingdom team's review by commissioning them to prepare training materials for a senior-level policy seminar in the "Improving Port Performance" series, financed by the Swedish International Development Authority (SIDA). This seminar was run for the first time in Jamaica in November 1989, with the participation of the World Bank.

8. The problem of maintenance had meanwhile been approached at the level of maintenance manager and workshop supervisor, through training courses prepared within UNCTAD's TRAINMAR Programme. A French-language course was prepared by collaboration between the Tunisian and Moroccan TRAINMAR Centres. The TRAINMAR Centre in Mexico adapted the course to the needs of the Latin American region, and a further version was prepared in English for Asian delivery. All three courses have been regularly delivered.

9. Maintenance questions featured largely in a video film self-study package entitled "Operating and maintenance features of container-handling systems", which was produced on the initiative of UNCTAD and the World Bank.

10. Maintenance has also been treated in the UNCTAD/IAPH series of monographs on port management, notably in Monograph No.3 - "Steps to effective maintenance", and Monograph No.8 - "Economic approach to equipment selection and replacement". These followed

UNCTAD-financed studies of specific technical questions by experts from the Federal Republic of Germany and Belgium.

11. Finally, direct elements of UNCTAD's technical assistance programme for maintenance improvement should be noted. For example, in a UNDP funded project for the Côte d'Ivoire, a computer-based equipment maintenance system was introduced.

12. All the above work programme, particularly the World Bank technical paper, has been taken into account by the UNCTAD secretariat in the preparation of this report.

II. NATURE OF THE PROBLEM

13. Following the swing from a labour-intensive to a capital-intensive business, port general cargo operations now rely heavily on the availability of well-maintained quay cranes, stacking equipment and transfer equipment of the appropriate type. Many ports no longer find it particularly difficult to recruit and train skilled equipment operators and drivers, and in most cases the point has been reached where the capacity of the infrastructure is broadly keeping pace with the rate of growth of traffic. But there is now a substantial number of ports where operations are slowed down or interrupted by failure of the equipment itself. Increasingly, it is the handling of freight containers which assumes the greatest importance.

14. In recent years the problem has become more severe, because equipment has become not only more complex, but also more critical. Some equipment (e.g. some of those with electronic control circuits) must be 100 per cent correctly-functioning or else they will not perform their task at all. The pace of technological change means that the maintenance task is likely to become even more difficult, and ports will not find it easy to maintain efficient engineering services without more effective policies.

15. Dry bulk cargo and liquid bulk cargo are special cases, normally being integrated systems. Although plant and equipment maintenance is equally critical, the technical task is normally so closely linked to the operation of the installation, and the impact of plant failure is so obvious, that maintenance has traditionally been much better managed.

Causes

16. Where ports have serious port equipment maintenance problems, the principal cause observed by UNCTAD and the World Bank is generally that port management - in the sense of both the responsible government ministries and the management of the port authority - does not have sufficient understanding of the costs of maintenance, of the need for maintenance and procurement to be properly organized or even of the costly consequences of poor maintenance. One effect of this lack of understanding is that there is no proper forecasting and allocation management of the funds necessary for the purchase of equipment and spare parts; the funding of maintenance is therefore often inadequate, not available on time, or incorrectly applied.

17. The problem is common to all transport modes (road, rail, etc.) and to all developing country undertakings which have a heavy capital equipment requirement, because most of this equipment cannot be made locally and thus makes big foreign currency demands.

18. It is clear in plant and vehicle comparisons between the developed and developing countries, irrespective of which sector of industry is examined, that in the richer countries average equipment age is lower. There is a much greater possibility, and willingness, to scrap old vehicles and plant early and to buy new, even in small enterprises. This is because only with modern equipment can the enterprise achieve the productivity it needs to survive. Any enterprise which is protected from this necessity tends to carry on working with an ageing fleet because, in spite of the adverse economic effects of an increasing maintenance cost, the postponement of the decision to replace it is an easy way to improve the short-term cash flow.

19. The longer-term view is that money spent on modern equipment will give increased operational efficiency which will save the organization substantially more in greater operational efficiency and lower costs. Unfortunately this relationship is weakened when other factors - such as bottlenecks caused by limitations in the road infrastructure - prevent the efficiency being realised. It is also weakened when the higher labour costs of maintaining an ageing fleet are incurred in local currency whilst the replacement costs are in foreign currency.

20. Although shortage of funds is one of the factors in equipment maintenance in the developing countries, the provision of adequate funding does not in itself solve the problem. Two other factors, discussed below, play a very important role:

- lack of management and technical skill;
- an unsatisfactory institutional environment.

21. The developing countries are thus faced with a different, and far more difficult, maintenance environment, giving rise to problems that often cannot be easily solved. The basic principles of sound, modern management techniques which are often used in the industrialized nations, are generally applicable to developing countries as well. However, the local environment often requires them to be adapted to specific requirements and the port management often needs to dedicate more time, more efforts and sometimes more resources to achieve similar results.

22. The quality of port maintenance varies widely between different developing countries, and sometimes between different zones and workshops in the same port. Some ports have very serious problems, usually caused by a historic build-up of old equipment and severe shortages of spares. Others have modern equipment but a shortage of skilled technicians. There are other ports in which it is the maintenance management which is deficient, with a lack of technical supervision and control. In spite of this variety, there are fundamental principles which apply accross the board. The UNCTAD secretariat has been co-operating with the World Bank to identify these principles and to inform, sensitize and train policy-makers of developing countries involved in port equipment management and maintenance. It may not be appropriate for the *Ad hoc* Group to enter into an examination of specific local maintenance problems. Nevertheless, it would seem advisable for the Group to review these basic principles, in particular the most important which have been summarized in this report, and to comment on them.

Scope of the problem

23. It is difficult to discuss the maintenance problem in strict isolation, since it is heavily dependent on other factors. This was a major finding of the joint work programme described in chapter I. It is essential to consider port maintenance on a wider basis, to include all factors which affect provision of the right equipment in the right place, at the right time. The following are the related areas in which policies need to be upgraded:

(a) Planning the port inventory;

(b) Equipment and spares procurement;

(c) Stores management;

(d) Equipment operations;

(e) Management structure;

(f) Human resource management;

(g) Management information systems.

24. In several of these areas the essence of the research conclusions is that problems would be largely solved by the application of modern techniques of general management: good principles of delegation, management style and discipline; rigorous cost accounting; simplified procedures; modern communications and information technology; more effective training policies.

25. However, these modern management techniques are needed in the maintenance function only in the same way as in every other port function. Moreover, it is not possible to separate the management of port equipment maintenance from the management of the port. They are intertwined and many maintenance problems are the direct result of deficiencies in general management. It is not, in any case, likely to be feasible to achieve much general management improvement in the maintenance function alone; this will depend upon a general change in the organization and management of the port as a whole.

26. Since it is necessary to limit the scope of the *Ad hoc* Group's work in this specific field, and to avoid dissipating effort, not all these general management points will be discussed in this report. It is essential, however, to consider certain directly related and crucial features of the seven areas listed above, namely:-

(a) the policy for replacement and renewal of equipment;

(b) the efficiency of the port's procurement procedures, both for the equipment itself and for spare parts;

(c) the relationship between the engineering service and the operations department (the equipment users);

(d) the delegation of authority to the chief engineer;

(e) the port's training strategy.

A much more detailed presentation of all issues is contained in the World Bank publication, "The management of port equipment maintenance" (INV 54).

27. A further major finding of the research is that the institutional framework in which the port operates is frequently responsible for seriously aggravating the maintenance problem. There is often an excessive and unjustified restriction on the port management's freedom to take financial decisions; procurement of equipment and spares, replacement policy and scrapping, are all subject to central control, even in ports which are in principle autonomous.

28. Surprisingly, it was found that in some cases the situation has in recent years become worse. The centralized control has become more strict, with the effect that delays due to over-cautious, bureaucratic procedures have become more widespread and damaging.

29. The collaborative research has built a clear picture of what are the essential components of an efficient maintenance system, based on the port management's understanding of the importance of maintenance, how much it costs and the need to budget it appropriately, and to create the right organizational structure, motivation and sense of pride. The components are :

- up-to-date knowledge of technical developments in cargo handling and equipment;
- a well-defined and planned inventory, matching the operational needs;
- a well-designed and tightly controlled equipment and spare parts procurement policy;
- a well-planned and implemented preventive and predictive maintenance programme;
- an appropriate scrapping and replacement policy and the corresponding legislative and administrative procedures;
- modern stores management systems;
- a good maintenance management information system;
- establishment of training and human resources development programmes through local training institutions;
- disciplined work scheduling and task implementation.

30. Whenever required, there may be a need for technical assistance programmes adapted to the local specificities and needs and aimed at the strengthening of effectiveness and self-substainability.

31. The problem for a port is to choose maintenance strategies which will give the greatest cost-effectiveness, and to rank these in priorities for implementation. Chapter III reviews the arguments on which such decisions may be made.

III. MAINTENANCE STRATEGIES

Maintenance objectives

32. In principle, a port should set primary operational objectives, such as ship waiting and turn-round targets, and the service functions such as equipment maintenance should be set matching secondary objectives. This approach is, however, rather academic; the matching is not strictly quantifiable. The maintenance targets can be set independently, to provide a level of performance of the maintenance function which conforms to accepted standards.

33. The basic measurement of the quality of maintenance performance is fairly simple. It is chiefly a matter of recording percentage availability, day by day, for each class of equipment, and targets can be set on this basis. (The percentage availability is the percentage of the number of pieces of equipment held on inventory which are available for operational use at the start of each day or shift.)

34. Most availability targets will lie in the range 65 to 95 per cent, the highest figures being appropriate to the most important equipment such as container gantry cranes, where often there will be a full-time engineering team on the terminal; the lowest figures may be acceptable where there is a large pool of minor equipment of mixed age.

35. A more searching assessment will take into account the cost of running the function, and the level of foreign currency disbursements. When a satisfactory cost accounting system and a maintenance management information system are installed, continuous monitoring of maintenance unit costs will allow local norms to be built up and realistic targets to be set.

36. Subsidiary objectives of this function, as in all others, may be set by management. They may, for example, be training objectives in terms of the number of technicians trained each year.

Planning the port inventory

37. Equipment planning, based on a forecast of traffic and cargo-handling technology trends, needs closer attention in most ports in developing countries. This is a difficult task to do correctly, since such future trends are uncertain and the procurement process usually takes several years. The equipment inventory is only likely to be matched to the actual operational task if several of the port's departments work jointly on the problem; it is particularly important for the Engineering Department to work hand-in-hand with the Operations Department.

38. A systematic procedure for sound equipment planning was given in the World Bank Technical Paper INV 54. The schematic drawing is reproduced in annex I.

Equipment replacement policies

39. Many ports in developing countries try to keep equipment in service for as many years as possible. They - or their financial controllers - either do not appreciate that this can be a more costly policy than replacement by new equipment at a much earlier date, or, faced with insuperable shortages of foreign currency, consider that this policy is unavoidable.

40. In their efforts to improve this policy, and introduce better practice in planning the port equipment inventory, several experts advocate introducing life-cycle costing as the method of choosing when to replace equipment. That is to say, finding the number of year's life which makes the average annual equipment cost (capital, operating and maintenance) a minimum, and choosing this period as the economic life, at the end of which the equipment would normally be replaced.

41. This is a valid and valuable concept which should be understood by all policy-makers concerned, since without it mistakes will continue to be made. It has been included in the UNCTAD seminar for policy-makers referred to in paragraph 9 and in The World Bank technical paper INV 54.

42. However, in the actual decision process, the economic life calculations are of limited use to most ports in developing countries. Usually, any new piece of equipment will be more productive and cost-effective, making the life-cycle costing method less applicable. Moreover, these methods call for a good deal of management skill and detailed cost analysis, for very little gain in procure-

ment efficiency. The main reason for this is that the optimum life curve of new equipment is usually very flat and excludes the cost of equipment down-time.

43. For example, the average annual cost of an equipment may remain virtually unchanged between a life of 10 years and a life of 20 years, with a very slight minimum in between. In such a case the replacement decision will be based on taking advantage of the rapid fall in average annual cost over, say, a 5-year life, but then making the actual replacement decision on performance and engineering, rather than economic, grounds. Where funds can be obtained, much shorter replacement periods can be highly beneficial to the operations, as has been found in many developed countries (see paragraph 18). In such cases, purchase decisions are more often made on entrepreneurial grounds rather than through economic optimization.

44. The difficulty of these methods should not be underrated. They call for the prediction, over the life of proposed new equipment, of operating costs, inflation, and the shadow cost of foreign exchange. Comparison of two proposals by calculating minimum average annual costs over a range of internal rates of return is a demanding task. The uncertainty of cost- benefit analysis (for example, in attempts to quantify the intangibles) is compounded by the problem of comparing operational performance of different items of equipment.

45. Where funds are strictly limited, all major port investment decisions should be subjected to the test of such economic cost-benefit analysis, as set out in UNCTAD documents "Appraisal of port investments" (TD/B/C.4/174) and "Port development" (TD/B/C.4/175/Rev.1). In the case of equipment, these methods are appropriate for appraisal of proposals to invest in or replace major items such as gantry cranes, or to replace a complete fleet of vehicles. But they can be detrimental, particularly for smaller investments, when they imply a spurious accuracy which can be used to restrict management's flexible response to changing circumstances.

46. It is normally an easy technical decision to choose the point when to stop maintaining a piece of equipment, write it off completely, and use it for cannibalization. The decision can frequently be linked to the need for a major repair on old equipment; faced with this, the engineer who has been given adequate authority can use his/her own judgement on whether the repair should be carried out, or whether the equipment is 'beyond economical repair'. There is no need for subtle calculation at that point. Note that the end of economic life is not the same for all equipment of the same batch, which calls for a 'tapered' scrapping policy.

47. One of the major problems that has been observed both by UNCTAD and by World Bank staff is the extreme difficulty of disposing of equipment in many developing country ports. Sometimes it is necessary to convene a board to make the decisions and this board often consists of very high-level government officials who are difficult to convene and not always familiar with port equipment maintenance. As a consequence the decision is postponed and the equipment is left at the back of the port to deriorate. Disposal decisions must be made by the port management on clear recommendations from the maintenance manager and supported by the operations manager. A major option which is frequently neglected is that the port should consider selling equipment which is thought to be redundant or obsolete. There is nearly always a buyer for equipment regardless of its condition.

48. The financial write-off of equipment is usually correctly done, over periods which are similar to those of developed countries. But due to the fact that appropriate funding has not been foreseen there is often no real possibility of replacing the equipment before several more years have gone by: the completely written-off equipment is then kept in service with increasing maintenance costs.

49. The shortage of funds for replacing equipment or buying spare parts should generally not be an insurmountable barrier, provided the appropriate steps are taken on time. First should come an assessment through a good information system of the equipment inventory and the financial requirements for its maintenance. Then, appropriate budget forecasting can be established including the foreign-currency component, which can be financed by the Central Bank or by earmarking part of the port's foreign-exchange earnings. Almost all ports are earning sufficient funds, through their pricing system, to finance directly or to reimburse loans for the financing and maintenance of port equipment, provided the responsible governement officials are informed and sensitized on time on the crucial role of the port equipment.

50. The principle of cannibalization - using parts of one piece of equipment to repair another - is often frowned on as bad practice. This is not always a logical attitude in ports in developing

countries. As soon as a piece of equipment has been declared 'beyond economical repair' it should be stripped down and used as a provider of spares. Often one assembly - such as a gear-box - will still be in good condition even when the equipment as a whole is beyond repair; the assembly or part will need to be entered into the inventory of the parts store.

51. To cannibalize in this way is better than keeping a park cluttered with written-off equipment awaiting administrative disposal procedures. Once all useful parts have been removed, normal scrapping procedures should be followed for the remaining carcass. However, a word of caution is needed here: cannibalization is only an acceptable practice when it is recommended and approved by the maintenance manager. The decision should never be left to technicians or junior staff.

Equipment and spares procurement

52. The task of equipment maintenance is critically affected by the policies adopted on two procurement issues:

- the provision of spare parts;
- standardization of equipment.

53. There has been a serious and damaging failure of some procurement agencies to appreciate the continuing need for spares back-up to keep equipment on the road. This has been one of the prime causes of inefficient maintenance.

54. It may be more useful in future to consider procurement of equipment and procurement of spare parts in a more integrated fashion, adapted to the local environment. Aid donors, government financial controllers, and port managements should consider that every piece of equipment arrives in the port trailing behind it years of servicing needs.

55. It is not sufficient merely to provide the equipment plus a few crates of spares based on the manufacturer's estimate of the first one or two year's needs. Experience has shown that such spares scales are often insufficient. They are approximate, based on a different operating and maintenance environment, and frequently incomplete. The manufacturers also tend to assume that minor engineering items will be available locally, which is usually not so.

56. In more advanced countries where the commercial sector is developed, with easy access to foreign currencies, this problem is best solved where the manufacturer is able to appoint a reliable local agent, who can keep a permanent stock of all standard spares, and who has a channel for getting special items quickly. This can eliminate several problems: delays in delivery; the need for piecemeal authorization of foreign exchange; and the need for the port to hold a wide range of spares in its own stores.

57. In those countries where the amount of equipment is not large enough to justify a local agent on normal commercial grounds, new solutions are needed.

58. If aid donors and recipient governments wish to see funds allocated to port equipment properly utilized, they should consider ways of ensuring that:

(a) the manufacturer includes in his bid the supply of all of the spares, imported consumables, etc., required to be replaced in accordance with the manual, for a period of, say, four years to be dispatched at six monthly intervals, plus maintaining an escrow account in the name of the port and the manufacturer for an agreed sum specified in the procurement document. In this way any spare part urgently required can be requested and forwarded without the need for foreign exchange application by the port to the central bank.

(b) equipment manufacturers give an undertaking to maintain a line of communications and advice to the port, either directly or through their local agent, including the updating of technical documentation and spare parts scales. Such communications must be in the working language of the recipient country.

Both bid provisions require very careful preparation of the procurement documentation.

59. In turn, port managements must play their part, by so organizing the procurement and financial procedures that the port engineering service can draw quickly on this spares funding as the need arises. The preferred management practice would be to set an annual spares budget for the service, both for local currency and for foreign exchange, and then to give the head of the service full authority to spend within this budget.

60. The second maintenance issue in procurement is the common error of providing equipment which makes the maintenance task more difficult. The main error is the procurement of too many different makes of equipment, each with their own spares follow-up. The result is a very large range of spares stock holdings, and the need for technicians skilled in each of the makes. This can reach the point where the stores management goes out of control, and the quality of the technicians' fault-finding and servicing suffers. To store the expensive parts, and to have technicians trained in all makes, can be a heavy cost penalty.

61. This problem is sometimes due to inflexibility in the process of reaching agreement on bilateral aid, particularly where such aid is tied to the choice of equipment manufactured in the donor country. Even though the port management expresses a preference for keeping the range of equipment in any class to a minimum, it is often difficult to introduce this additional requirement into the negotiation of the aid agreement. Although it seems quite contrary to the spirit of international aid, the defensive approach of at least one recipient government agency is that "beggars can't be choosers".

62. A similar difficulty occurs when competitive bidding for the supply of equipment is opened to all manufacturers, and selection is on the basis of the lowest price. Such open bidding is strongly to be discouraged; limiting the tender invitations to a small number of preselected firms can give the control which is needed, keeping the range of equipment types to a manageable size. To avoid the danger of losing quality and technological innovation, a new manufacturer can be included in the list from time to time.

63. The problem can be to some extent reduced by identifying parts and sub-assemblies which are common to different makes, and specifying these in the tender invitation.

64. It is very desirable that donor countries, multilateral and international funding agencies, international agencies, and recipient countries make a joint effort to encourage measures to reduce the proliferation of different makes of equipment in any one developing country.

The management of maintenance

65. The research programme has shown that in many developing countries the quality of management will need to be substantially improved before the equipment maintenance function becomes a contributor to, rather than an impediment to, port efficiency.

66. Most of the issues are in the realm of general management. It is outside the scope of this report to consider the improvements in general management which may be needed in developing country ports. From the maintenance standpoint, as from several others, there is a strong case for developing a modern, less hierarchical organizational structure combined with greater delegation and trust, a greater degree of performance assessment and a more enlightened human resources management.

67. The issues of more direct interest which emerged from the research are:

- Status of the maintenance function;
- Organisational structures;
- Decentralisation of maintenance;
- Contracting out of maintenance services;
- Line and functional relationships;
- Management style;
- Accountability;

- Employee skills;
- Development of technician teams.

68. The status of the maintenance function has begun to be appreciated in many ports, and this is reflected in the raising of engineering to full departmental status, as in annex II.A. This can result in a more sympathetic allocation of resources to the engineering service, and is a development which should be more widely followed, especially as cargo-handling becomes increasingly mechanized.

69. An alternative approach which takes account of the need for the closest collaboration between the operational (or traffic) department and the engineering department, is shown in annex II.B. Here the functions of operations and of maintenance are both brought under the control of the head of operations, who is given the rank of Deputy Director. This chain of command can be particularly valuable in encouraging the release of equipment for systematic preventive maintenance. Because of the need for senior professional status in engineering mentioned above, and because there are several other port engineering functions apart from equipment maintenance, a separate Engineering Manager is also appointed at departmental head level. The wider role of the Engineering Manager includes giving technical support to the maintenance manager, but he/she is not responsible for the maintenance service, which remains under the executive control of the Deputy Director Operations.

70. There are possible approaches to restructuring of the engineering services which, although attractive in themselves, are not likely to be helpful where they run counter to the general management culture of the organization. This is true of the concept that the equipment pool could be 'owned' by the engineering department and 'hired out' to the operations department. This is a logical and attractive proposal, with built-in incentives for all concerned. However, in many ports it requires a drastic change of management style and financial accountability.

71. The decentralization of maintenance has been shown to lead to valuable improvements. A modern port with distinct operational zones - container terminal, dry bulk berths, etc. - will find it more efficient to give each zone a specialized workshop and stores, rather than relying on one central workshop and store. This minimizes travel distances, allows technician specialization, and improves co-operation between engineering and operations staff. This principle can even be extended with advantage to break-bulk berths, by grouping them into functional 'sections', each with its own maintenance function, at least for the usual preventive maintenance tasks.

72. It can also be argued that the engineering services can gain by combining the electrical and mechanical functions wherever feasible. At the higher levels this has been shown to shorten the management chain and make it less hierarchical, and to make co-ordination of the maintenance task simpler. It also facilitates the formation of multi-disciplinary teams of technicians which are a valuable approach to maintenance of modern technology.

73. Some modern developments in applying this multi-disciplinary approach have proved very successful. These include the formation of small maintenance units, each self-contained except for the most specialized skills, with authority delegated to the unit leader to the maximum extent; this has been found to encourage initiative and a team spirit which has been highly beneficial. Specialist technicians with a higher grade reflecting their skill are called on to work with the team for specific tasks.

74. Annex II.C shows the possible organization of a maintenance department which takes account both of the principle of decentralization (into Area A and Area B) and of delegation to multi-disciplinary "front line" teams each headed by a Foreman.

Contracting out

75. Where the port's own staff lack a particular specialist skill for a repair, there is the option of contracting out the job to an external firm. There are several views on this. One is that, if external skill and capacity exists it should be used, in preference to setting up internal facilities which duplicate it and will probably be more costly: the port should only do what cannot be done effectively outside. The opposite view is that it is necessary to keep the function under public control, and that contracting out should be minimized.

76. If an external contractor is used, it can be either for:

(a) highly-specialized tasks, because these may not occur often enough in the port to justify keeping full-time skilled staff and special facilities, whereas a specialized private company can concentrate on the one skill and do so for a range of clients; and because the port may not be able to match the higher wages demanded by such staff;

(b) the simpler maintenance tasks, for which there is usually ample skill and facilities in the local town, leaving the port with the higher skills, partly in order to keep up internal technician motivation and career prospects.

77. Twenty years ago one would not have expected to find specialized engineering skill in the local town in a developing country, so (a) would have been ruled out. Today, the specialist skills have often developed as well. Thus, both the above types of contracting out may now be feasible.

78. An effective strategy would seem to be that a port should use external facilities whenever they offer a faster, cheaper or less demanding solution, and not otherwise. According to the manpower situation and the scope of the port's facilities, management should agree on a strategy for each main technical area and authorize the chief engineer to implement it as he/she thinks fit.

Training

79. For the last 20 years the UNCTAD secretariat has given high priority to the development and implementation of several training programmes aimed at the enhancement of the port manpower competence and self-reliance. To achieve all the desired results, such training has to be conceived as part of a human resources development scheme, including the manpower planning, management and evaluation. All these principles are of paramount importance for the port equipment maintenance function. The concept of self-sustainability is also essential in this field. Funds have to be secured, sometimes from contribution by the employers, and either training facilities with a corps of professional trainers have to be developed or arrangements have to be made for the utilization of existing training facilities in the port or neighbouring area.

80. UNCTAD's training of maintenance policy-makers through the IPP programme, and of managers and workshop supervisors through the TRAINMAR programme, have been funded so far by UNDP and SIDA. These will continue to be developed, within available resources. In the TRAINMAR network, courses in maintenance are increasingly being implemented by locally-funded training centres. In the IPP programme, which concentrates on policy seminars, a course on port equipment - policy, management and maintenance - has been recently produced and validated in Jamaica with SIDA funds.

81. Every piece of modern equipment brings with it the need for a range of technician skills. Some of these, particularly in electronics and control systems, are high-level and call for extensive technician training. In a modern port, to keep up with such demands, the manpower plan for technicians should be based directly on the port's equipment inventory, and each time new equipment is supplied, the manufacturers should include a statement of the skills needed. The port's specification should include this requirement.

82. The training of technicians has been assisted by the ILO. Unfortunately, it has sometimes been difficult for ports to obtain sufficient financial support to establish full programmes in this area. There are several reasons for this:

(a) Most technician training has to be based on specific equipment, of which there is a wide range;

(b) The technician skills most in demand have arrived on the scene only very recently;

(c) The high-level skills are not peculiar to the port field, but occur in nearly all branches of industry.

83. The two major avenues for advanced technician training continue to be the equipment manufacturer and the national technical schools. In both cases the history of recent years has been patchy. Manufacturer's training programmes, usually linked to procurement under an aid project, have in some cases been excellent; in many others, perfunctory or insufficiently planned. National technical schools also vary widely in quality; for advanced modern technologies there is often a serious shortage of facilities and instructors. The role of a port's own training institution must also be considered. In many cases, training centres have been established, often with assistance from

UNCTAD, ILO and IMO. For technician training, such centres normally proceed by first establishing training schemes in the more basic skills - welding, machine-shop practice, basic electrical work, etc. This appears to be appropriate, although it could be argued that such basic skills training is often already available in technical schools. There is a case for ports relying more on external training for the basic skills, and concentrating the limited resources of their own training centre on teaching the application of these skills (practising actual repair of port equipment). For further advice in this area, ports should contact the ILO.

84. Such questions of training policy are not easy to resolve in any particular case. This could be a further reason for more ports to join the TRAINMAR network, in which a key activity is assisting its members to apply a systematic approach to training needs analysis and to the design of a training strategy.

IV. IMPLEMENTATION STRATEGIES

85. Before recommending priorities for maintenance improvement strategies, a word of caution must be given on the question of implementation. Port equipment maintenance cannot be treated in isolation. It is closely related to the cargo-handling operation, depends directly upon procurement policies, and must be harmonized with other services such as accounting and information management. Therefore, proposals which entail substantial changes in the whole of the maintenance function of a port (which can include complex stock control systems, re-structured departmental management, sophisticated cost control procedures, strict preventive maintenance progammes, new workshop documentation, etc.) are not likely to be successful unless they are part of an overall re-organization of the port. Such major management decisions will normally have been preceded by a comprehensive analysis of all the port functions, and the relations between them and the maintenance function. [1]

86. By contrast, proposals to improve the maintenance function independently will usually be too demanding unless they are confined to one or two key issues. Port managers who have found it difficult to solve the existing maintenance problem are unlikely to be able to cope with more than one or two radical changes at the same time without the participation of all heads of department.

87. In view of their widely differing needs, as mentioned in paragraph 22, it may be necessary to use simple solutions in some ports, and more advanced solutions in others. The sophisticated remedies which are sometimes advocated can be inappropriate and to some extent self-defeating. The idea that a bad maintenance function can be cured simply by introducing computers for the whole function is particularly suspect. Computers can be introduced more successfully and with minimum disruption when the underlying systems are already well-defined and implemented manually.

88. In many cases the strategy more likely to succeed is to put aside complicated systems, concentrate only on two or three key issues, and introduce well-disciplined but straightforward measures.

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[1] An example of such comprehensive re-structuring in Morocco is described in the 1989 UNCTAD report "Port administration and organization - a noteworthy experiment in Morocco" (UNCTAD/SHIP/627).

V. RECOMMENDATIONS

89. Bearing in mind the above general reservations,

A. It is recommended that senior port managers and officials from government controlling agencies should be more informed, sensitized and trained on the importance of the port equipment maintenance function and in the application of a range of modern equipment management techniques to ports.

B. It is recommended that port equipment aid programmes should be framed as a package which, in the initial loan provisions, includes:

(a) either funding for all the spares to be replaced in accordance with the manual for periods of some years (e.g. four years) to be dispatched at six monthly intervals, plus maintaining an escrow account in the name of the port and the manufacturer for an agreed sum; or a commitment by the manufacturer that all the necessary spare parts will be available in the store of the local agent, over the life of the equipment;

(b) training by the equipment manufacturers of the initial establishment of technicians needed to maintain the equipment, and follow-up training of replacement technicians to be organized by the recipient port over the equipment's life.

The *Ad hoc* Group may wish to consider the desirability of donor and recipient governments participating in a Group session to agree guidelines for port equipment aid programmes.

C. It is recommended that manufacturers of port equipment should adopt special maintenance technique standards in equipment supplied to developing countries. These standards should include ease of repair under difficult conditions, greater replaceability and interchangeability of sub-assemblies, enhanced documentation, and more detailed spares scales for tropical and humid climates.

The *Ad hoc* Group may wish to consider the desirability of representatives of manufacturing countries and of ports in developing countries participating in a Group session to agree on guidelines for manufacturers.

D. It is recommended that government agencies which are responsible for supervising ports in developing countries should exert greater control over bilateral aid projects involving the supply of port equipment. This control should be aimed at, *inter alia*, reducing the number of different makes of any class of equipment to the minimum.

The *Ad hoc* Group may wish to consider ways of implementing short policy seminars, for appropriate high-level officials, on such maintenance-related issues.

The *Ad hoc* Group may wish to consider ways of funding the widespread delivery of UNCTAD's Policy Seminar IPP3 on Equipment Management (developed within the "Improving Port Performance" programme).

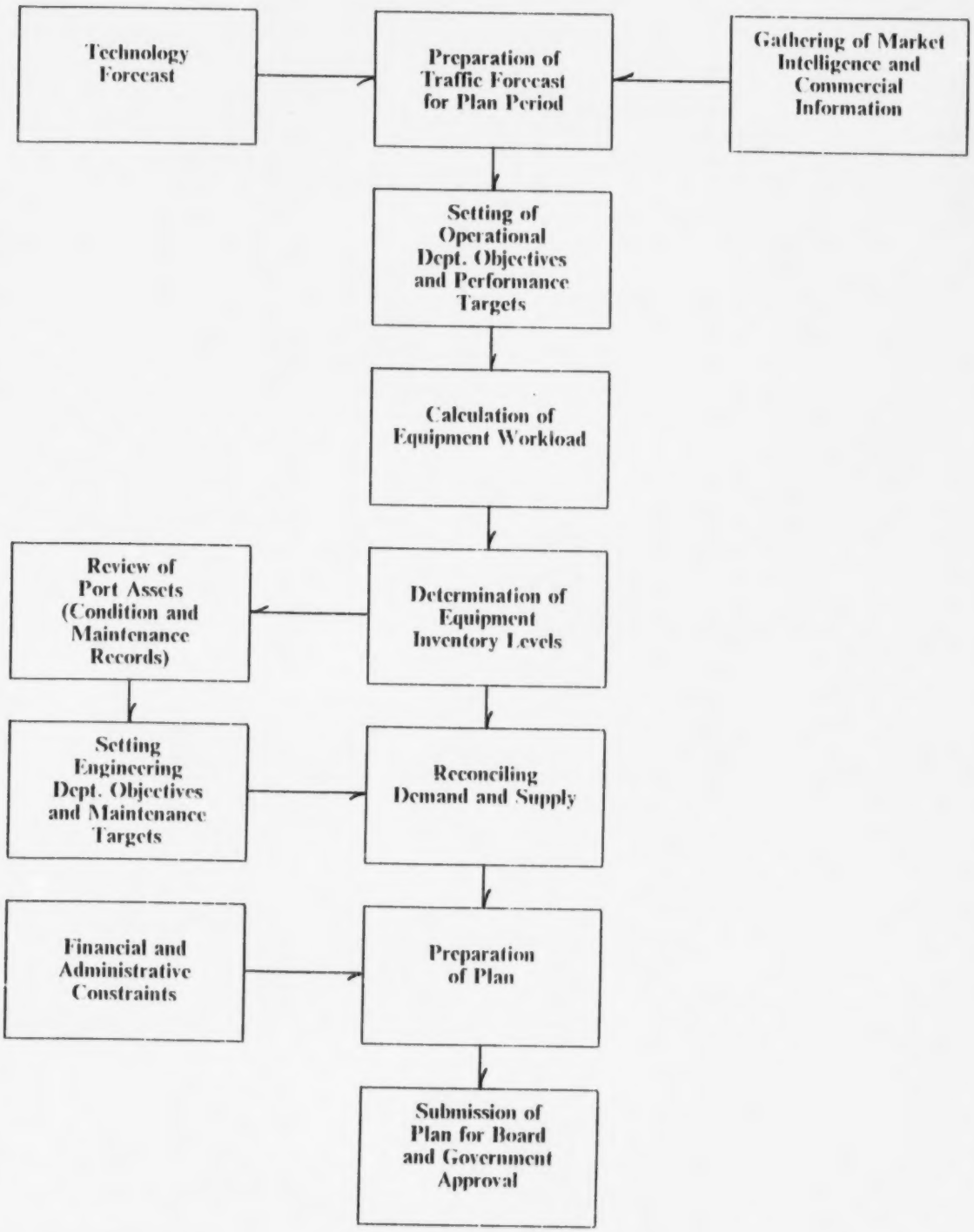
E. It is recommended that ports make greater use of the possibilities for co-operation with other ports in their region in the solution of their maintenance problems (spares procurement, training, specialist trouble-shooting, etc.). They should also pursue more vigorously the co-operation with ports in developed countries that the *Ad hoc* Group has previously endorsed, and include in this a specific maintenance support element, in which the local donor agency should be included.

The *Ad hoc* Group may wish to consider ways of strengthening this South-South and North-South co-operation.

F. It is recommended that in view of the need to develop a sound training policy, and to strengthen in-house training, ports in developing countries should join the TRAINMAR network, participate in the training of trainers, and make full use of national and international training programmes developed by all co-operating agencies.

Annex I

SCHEMATIC DRAWING OF A LOGICAL EQUIPMENT PLANNING PROCESS

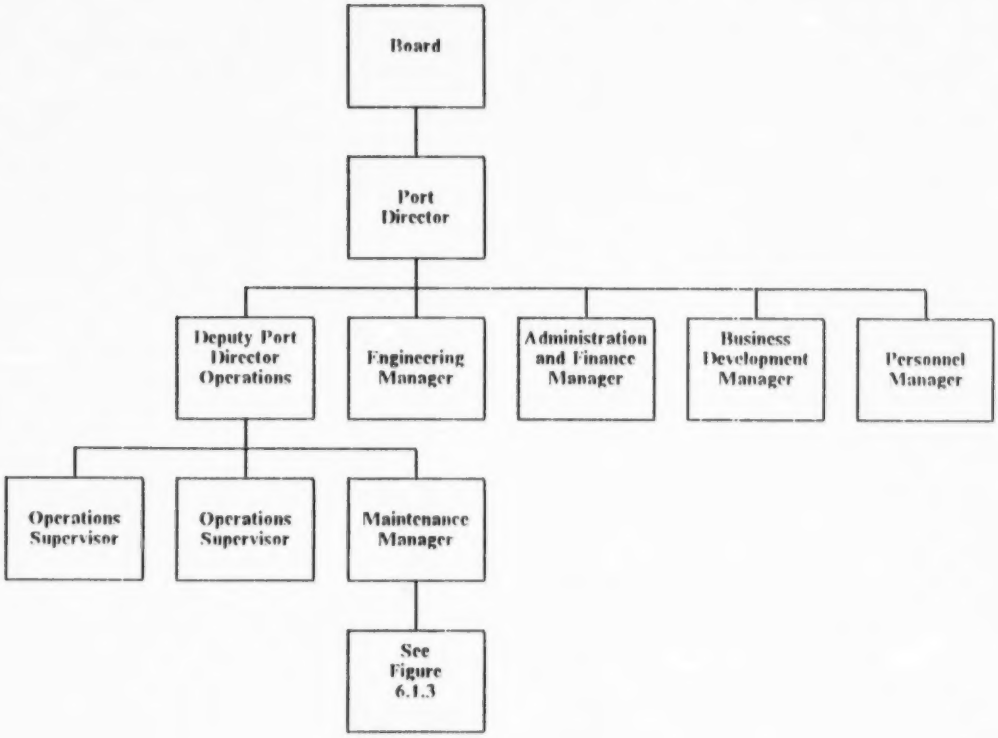

Technology Forecast
Preparation of Traffic Forecast for Plan Period
Gathering of Market Intelligence and Commercial Information
Setting of Operational Dept. Objectives and Performance Targets
Calculation of Equipment Workload
Review of Port Assets (Condition and Maintenance Records)
Determination of Equipment Inventory Levels
Setting Engineering Dept. Objectives and Maintenance Targets
Reconciling Demand and Supply
Financial and Administrative Constraints
Preparation of Plan
Submission of Plan for Board and Government Approval

Source: World Bank technical paper, 'The management of port equipment maintenance' (INV 54) reproduction of Figure 4.1.1, page 16.

Annex II
ORGANIZATION OF THE MAINTENANCE FUNCTION
A. Typical port organizational structure (UNCTAD)

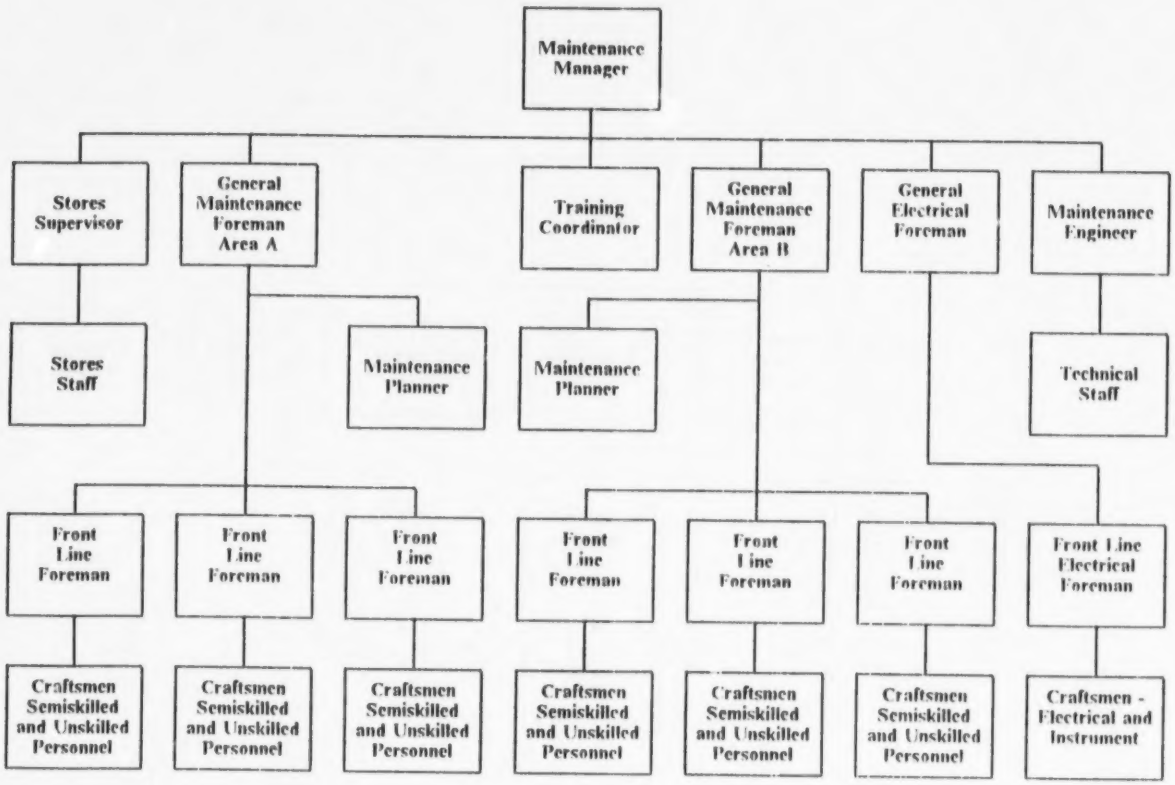
Source: UNCTAD TD/B/C.4/175/Rev.1, reproduction of Figure 6, page 19.

B. Recommended approach (World Bank)



Source: World Bank technical paper, 'The management of port equipment maintenance' (INV 54) reproduction of Figure 6.1.2, page 58.

C. Maintenance Department (World Bank)



Source: World Bank technical paper, 'The management of port equipment maintenance' (INV 54) reproduction of Figure 6.1.3, page 60.